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COMPANY

WALTER F. WELLS, PRESIDENT

National Electric Light Association

Forty-Second Convention

General and Executive Sessions

PAPERS, REPORTS and DISCUSSIONS

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An amendment to the Constitution to provide for a limited class of membership in Company Sections and to afford a more dignified status for Class B members is advocated. A large number of active Sections is the present need. Dragnet methods of soliciting membership should be abandoned and Association membership should be allowed to stand on its own merits. Tendency to form local employees' clubs should be offset by more liberal provisions for membership in Company Sections.

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1st	Chicago, Feb 25-26, 1885	James F Morrison
2nd	New York, Aug 18-20, 1885	James F Morrison
3rd	Baltimore, Feb 10-12, 1886	James F Morrison
4th	Detroit, Aug 31-Sept 2, 1886	James F Morrison
5th	Philadelphia, Feb 15-17, 1887	James F Morrison
6th	Boston, Aug 9-11, 1887	James F Morrison
7th	Pittsburgh, Feb 21-23, 1888	James F Morrison
8th	New York, Aug 29-31, 1888	Samuel A Duncan
9th	Chicago, Feb 19-21, 1889	Samuel A Duncan
10th	Niagara Falls, Aug 6-8, 1889	Edwin R Weeks
11th	Kansas City, Feb 11-14, 1890	Edwin R Weeks
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13th	Providence, Feb 17-19, 1891	Marsden J Perry
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21st	Chicago, June 7-9, 1898	Samuel Insull
22nd	New York, May 23-25, 1899	Alden M Young
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24th	Niagara Falls, May 21-23, 1901	James Blake Cahoon
25th	Cincinnati, May 20-22, 1902	Henry L Doherty
26th	Chicago, May 26-28, 1903	Louis A Ferguson
27th	Boston, May 24-26, 1904	Charles L Edgar
28th	Denver-Colorado Springs, June 6-11, 1905	Ernest H Davis
29th	Atlantic City, June 5-8, 1906	William H Blood, Jr.
30th	Washington, June 4-8, 1907	Arthur Williams
31st	Chicago, May 19-22, 1908	Dudley Farrand
32nd	Atlantic City, June 1-4, 1909	William C L Eglin
33rd	St. Louis, May 23-27, 1910	Frank W Frueauff
34th	New York, May 29-June 2, 1911	W W Freeman
35th	Seattle, June 10-14, 1912	John F Gilchrist
36th	Chicago, June 2-6, 1913	Frank M Tait
37th	Philadelphia, June 1-5, 1914	Joseph B McCall
38th	San Francisco, June 7-11, 1915	Holton H Scott
39th	Chicago, May 22-26, 1916	Edward W Lloyd
40th	New York City, May 9-10, 1917	Herbert A Wagner
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Wm C L Eglin
W W Freeman
P M Lincoln
Paul Spencer
Arthur Williams

Representing the Colleges

Prof M C Beebe
Prof H E Clifford
Prof C L Cory
Prof O J Ferguson
Prof C F Harding
Prof L A Herdt
Prof V Karapetoff
Prof S G Palmer
Prof S R Pritchard
Prof H J Ryan
Prof G D Shepardson

Reorganization of Geographic Sections

Samuel Insull, Chairman
Commonwealth Edison Company, Chicago, Ill.

R H Ballard
John A Britton
Charles L Edgar
Joseph B McCall

Safety Rules and Accident Prevention

Wm C L Eglin, Chairman
The Philadelphia Electric Company, Philadelphia, Pa

Magnus Alexander
R L Baker
P H Bartlett
W H Blood, Jr
John A Britton
H J Burton
E D Edmonston
L L Elden
John B Fisken
H B Gear
H B Harmer
J A Lighthipe
R J McClelland
Wills MacLachlan
W T Morrison
Farley Osgood
S G Rhodes
H H Schoolfield
Charles B Scott
H H Scott
Paul Spencer
Thomas Sproule

Valuation Terminology

J N Shannahan, Chairman
Newport News & Hampton Railway, Gas & Electric Co., Hampton, Va.

P P Bird
E W Burdett
H M Edwards
L L Elden
Morrell W Gaines
J H Gulick
R S Hale
Charles Markell
C F Uebelacker

ACCOUNTING SECTION

Officers and Committees, 1918-1919

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R W Symes, Vice-Chairman
The Detroit Edison Company, Detroit, Mich.

Frederick Smith, Secretary
The New York Edison Company, New York City

C E Calder, Treasurer
Texas Power & Light Company, Dallas, Texas

Executive Committee

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E J Fowler
F L Hall
W E Long
Wm Schmidt, Jr
D M Trott
J C Van Duyne

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Past-Chairman H M Edwards
Past-Chairman John L Bailey

Accounting Education

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Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

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L A Coleman
Leavitt L Edgar
Fred R Jenkins
W A Jones
James Lawrence
A J O'Connor
F H Patterson
D M Trott

Accounting Efficiency

E C Scobell, Chairman
Rochester Railway & Light Co., Rochester, N. Y.

Accounting Relations With Other Associations

William Schmidt, Jr, Chairman
Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

Accounting Service to Member Companies and the Monthly Bulletin

Frederick Smith, Chairman
The New York Edison Company, New York City
F L Hall, Editor

Classification of Accounts

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Consolidated Gas. Electric Light & Power Co., Baltimore, Md.

Commission Accounting Rulings

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Commonwealth Edison Company, Chicago, Ill.

C H Allen
E H Davis
E D Dreyfus
H C Hopson
H T Hughes
W A Jones
A C Van Driesen

Cost Accounting and Statistics

A D Spencer, Chairman
The Detroit Edison Company, Detroit, Mich.

W E Long
B C Taylor
A C Van Driesen
T J Walsh

Customers' Records and Billing Methods

H C Schlegel, Chairman
The New York Edison Company, New York City

R F Bonsall
A E Dickson
E J Fowler
A S Hall
I S Hall
H T Hughes
J D Jacobus

Form of Annual Report to Commissions

W J Meyers, Chairman
The United Electric Light & Power Co., New York City

H R Frost
C H Hodskinson
W E Houghton
W A Jones
H R Kern
G M Moore
R H Smith

Merchandising Accounting

F A Birch, Chairman
The Philadelphia Electric Co., Philadelphia, Pa.

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W E Best
L A Coleman
F L Hall
C W Johnson
H B Lohmeyer
F H Patterson

Operating Records

C A White, Chairman
The Edison Electric Illuminating Co. of Boston, Boston, Mass.

W R Dyke
E J Fowler
R B Grove
G P Landwehr
H B Lohmeyer
E C Scobell
H A Snow

Purchasing and Storeroom Accounting

W F Stevens, Chairman
The Edison Electric Illuminating Co. of Boston, Boston, Mass.

K C Campbell
R W Crowell
H F Frasse
C E Marden
W J McCullough

COMMERCIAL SECTION

Officers and Committees, 1918-1919

C J Russell, Chairman
The Philadelphia Electric Company, Philadelphia, Pa.

John G Learned, Vice-Chairman
Public Service Company of Northern Illinois, Chicago, Ill.

M S Seelman, Jr, Vice-Chairman
Brooklyn Edison Company, Inc., Brooklyn, N. Y.

Henry Harris, Secretary
Duquesne Light Company, Pittsburgh, Pa.
A Jackson Marshall, Executive Representative
N.E.L.A. Headquarters, New York City

EXECUTIVE COMMITTEE

M O Dellplain
E A Edkins
F H Gale
W H Hodge
Oliver R Hogue
Thomas F Kelly
S M Kennedy
H R King
J C McQuiston
C E Michel
F D Pembleton
A A Pope
James R Strong
R H Tillman

Commercial Service and Relations With Customers

R F Bonsall, Chairman
Consolidated Gas, Electric Light & Power Company, Baltimore, Md.

L A Coleman
F F Kellogg
L F Mowry
F H Patterson
H M Simkins
Clare N Stannard
Harold Wright

Compensation of Salesmen

C J Russell, Chairman
The Philadelphia Electric Company, Philadelphia, Pa.

F D Beardslee
P J Denninger
O R Hogue
Glenn R Trumbull
L R Wallis

Co-ordinate Advertising and Sales Campaigns

Henry Harris, Chairman
Duquesne Light Company, Pittsburgh, Pa.

N H Boynton
J E Davidson
W L Frost
F H Gale
L D Gibbs
D H Howard
John G Learned
H N McConnell
J C McQuiston
F D Pemberton
Charles J Russell
M S Seelman, Jr
P L Thomson
J M Wakeman

Education of Salesmen

Fred R Jenkins, Chairman
Commonwealth Edison Company, Chicago, Ill.

George G Bowen
W W Briggs
John A Britton
A W Childs
Rawson Collier
F A Coupal
F A DeLay
J F Derge
C S Emmert
T P Gaylord
H J Gille
L C Haskell
M H Hendee
George R Jones
H R King
F A Leach, Jr
R B Mateer
W T McIntyre
M C Osborn
W S Robertson
C R Rudy
Joseph B Seaman
F J Sill
W M Skiff
Clare N Stannard
L R Wallis
R F Whitney
C E Yacoll

Electric Range

C E Michel, Chairman
Union Electric Light & Power Company, St. Louis, Mo.

John Abbink
J P Clayton
J D A Cross
Theodore Dwight
C E Greenwood
George A Hughes
Hartwell Jalonick
J F Killeen
C N Lewis
B S Manuel
J H Risser
J F Roche
R B Snyder
Adolph Strauch
F A Wright
H E Young

Electrical Salesman's Handbook

R H Tillman, Chairman
Consolidated Gas, Electric Light & Power Company, Baltimore, Md.

E W Ackerman
C J Carlsen
J M Curtin
R B Grove
I Lundgaard
S S Neu
W H Onken, Jr
T D Rose
G H Stickney
E F Tweedy
E L Wilder

Finance

John G Learned, Chairman
Public Service Company of Northern Illinois, Chicago, Ill.

F H Gale
J C McQuiston

Merchandising

E R Davenport, Chairman
Narragansett Electric Lighting Company, Providence, R. I.

Representing Central Stations

L C Cass
J E Davidson
C F Farley
C E Greenwood
Henry Harris
O R Hogue
C E Michel
F D Pembleton
Dorsey R Smith
William S Wallace

Representing Manufacturers

F M Feiker
Clyde A Flint
R E Flower
J F Killeen
A G Kimball
H A Lewis
L H Mertz
M C Morrow
M Schwarz
W S Templin
J M Wakeman

Publications

F D Pembleton, Chairman
Public Service Electric Company, Newark, N. J.

F D Beardslee
N H Boynton
W H Easton
F H Gale
L D Gibbs
Henry Harris
A W Hawks, Jr
W H Hodge
D H Howard
J S Kennedy
J E McKirby
A C McMicken
J C McQuiston
L H Newbert
C H Pierson
M S Seelman, Jr
Philip L Thomson
Earl E Whitehorne
R R Young

Sale of Company Securities to Customers and Resident Citizens

W H Hodge, Chairman
H. M. Byllesby & Co., Chicago, Ill.

Franklin L Hall
C M Hamilton
A F Hockenbeamer
A N Kemp
H Spoehrer
E F Stone
C L Van Valkenburg
P H Whiting
C E Yacoll

Wiring

R S Hale, Chairman
The Edison Electric Illuminating Company of Boston, Boston, Mass.

S E Doane, Vice-Chairman
National Lamp Works of General Electric Co., Cleveland, Ohio

H W Blivin
Rawson Collier
Theodore Dwight
A P Good
E A Hawkins
D A Hegarty
J A Hunnewell
T A McDowell
E R Northmore
Farley Osgood
A A Pope
H R Sargent
R H Tillman
H H Wood

LIGHTING SALES BUREAU

C L Law, Chairman
The New York Edison Company, New York City

A Jackson Marshall, Secretary
N.E.L.A. Headquarters, New York City

EXECUTIVE COMMITTEE

P H Bartlett
F D Beardslee
N H Boynton
A M Childs
C G Durfee
W A Durgin
Ward Harrison
O R Hogue
E N Hyde
C W Johnson
A C McMicken
H I Markham
E A Mills
M C Morrow
L H Newbert
M C Osborn
A L Powell
W R Putnam
G Bertram Regar
Fred Scheel
Thomas Sproule
E F Stone
E E Whitehorne
A S Witmer
H E Young
George Williams

LIGHTING SALES BUREAU COMMITTEES

Commercial Aspects of Lamp Equipment

O R Hogue, Chairman
Commonwealth Edison Company, Chicago, Ill.

K E Adams
J H Allen
F D Beardslee
W T Blackwell
S B Burrows
E L Callahan
R C Close
Burleigh Currier
J F Derge
F H Golding
Ward Harrison
Otis L Johnson
P O Kennedy
C L Law
A H Loring
H C Meredith
A A Pope
A L Powell
G Bertram Regar
J L Stair
W A Wolls

Commercial Aspects of Street and Highway Lighting

C G Durfee, Chairman
Rochester Railway & Light Company, Rochester, N. Y.

John West, Vice-Chairman
C. H. Tenney & Co., Boston, Mass.

R C Bach
C M Benedict
D K Chadbourne
H O Clark, Jr.
W E Clement
C A Dean
W T Dempsey
Walter L Hareden
Ward Harrison
M H Hendee
C W Johnson
Drew Johnston
W F Kohlbecker
Harry S Lofquist
W H McBride
George A Mau
M C Morrow
W R Putnam
W H Rolinson
J H Ross
C W Ruprecht
W R Sammons
John V Strange
J A Summers

Electrical Advertising

E A Mills, Chairman
The New York Edison Company, New York City

H I Markham, Vice-Chairman
Federal Sign System (Electric), Chicago, Ill.

R P Burrows
L R Crawford
C A Dean
C J Eaton
R E Harrington
E R Kelsey
W H McBride
W H McIntyre
J C McQuiston
Earle L Milliken
F H Murphy
L H Newbert
E S Pelling
Elliott Reid
W R Sammons

Industrial Lighting

William A Durgin, Chairman
Commonwealth Edison Company, Chicago, Ill.

F O Broili
G T Dunklin
R B Ely
F L Frizzel
W H Hamilton
M H Hendee
J T Huntington
O L Johnson
W H McBride
C A Mau
F H Murphy
L F Riegel
J W Ruff
W R Sammons
J L Stair
H D Stokes
F C Taylor
G B Walker

Lighting of Public Buildings

G Bertram Regar, Chairman
The Philadelphia Electric Company, Philadelphia, Pa.
Ward Harrison, Vice-Chairman
National Lamp Works of General Electric Co., Cleveland, Ohio

M T Blackwell
H A Brooks
F A Gallagher
O R Hogue
C L Law
W H McBride
A B Oday
J L Stair
C S Walton

Outdoor Lighting

H H Magdsick, Vice-Chairman
National Lamp Works of General Electric Co., Cleveland, Ohio

N R Birge
D K Chadbourne
C A B Halvorson
H W Korhammer
W G Marthai
W Reed
Elliott Reid
William A Root
J L Stair
C J Van Gieson

Possible Causes of Decrease in Revenue and Suggestions for Remedying Such Conditions

George Williams, Chairman
H. L. Doherty & Co., New York City
L C Spake, Vice-Chairman
Electrical World, New York City

F W Boldenweck
George B Foster
H J Gille
Thomas F Kennedy
A C McMicken
H N McConnell
A K Young

Residence Lighting

C W Johnson, Chairman
Hodenpyl, Hardy & Co., Jackson, Mich.
Edwin Mandeville, Vice-Chairman
Worcester Electric Light Company, Worcester, Mass.

C M Benedict
J C Chestnut
W B Christie
Charles A Collier
J F Derge
S C Dowling
C J Eaton
Robert B Ely
F A Gallagher
John S Hogan
A E Lennox
Lewis A Lewis
W A McKay
F H Murphy
Fred H Scheel
J H Slade
H T Spaulding
F C Taylor
G W Uzzell
George H Watson
A B Wollaber

Store Lighting

A L Powell, Vice-Chairman
Edison Lamp Works, Harrison, N. J.

Charles T Barnes
E Mandeville
H T Spaulding

POWER SALES BUREAU

George H Jones, Chairman
Commonwealth Edison Company, Chicago, Ill.

C H Stevens, Vice-Chairman
Leslie, Stevens Company, New York City

H H Holding, Secretary
Public Service Electric Company, Newark, N. J.

EXECUTIVE COMMITTEE
Officers and

F W Boldenweck
E L Crosby
J M Curtin
M C Gilman
O R Hogue
C A Kelsey
M G Kennedy
R H Knowlton
I Lundgaard
E S Mansfield
Charles J Russell
Sidney G Vigo
N T Wilcox
E L Wilder

ORGANIZATION OF WORK
Electro-Chemical Division

Chas J Russell, Chairman
Philadelphia Electric Company, Philadelphia, Pa.

General Power Division

R H Knowlton, Chairman
United Gas Improvement Company, Philadelphia, Pa.

Industrial Electric Heating Division

E L Crosby, Chairman
Detroit Electric Furnace Company, Detroit, Mich.

Isolated Plant Division

I Lundgaard, Chairman
Rochester Railway & Light Company, Rochester, N. Y.

ELECTRIC VEHICLE SECTION
Officers, 1918-1919

E S Mansfield, Chairman
The Edison Electric Illuminating Company of Boston, Boston, Mass.

George B Foster, Vice-Chairman
The Commonwealth Edison Company, Chicago, Ill.

H M Edwards, Treasurer
The New York Edison Company, New York City

A Jackson Marshall, Secretary
N.E.L.A. Headquarters, New York City

EXECUTIVE COMMITTEE
Officers and

Charles Blizard
E P Chalfant
Gaylord A Freeman
Frank W Frueauff
Walter H Johnson
T I Jones
James H McGraw
Frank W Smith
H G Thompson
Charles A Ward
E R Whitney
Arthur Williams

STANDING COMMITTEES

Federal and Municipal Transportation

James H McGraw, Chairman
McGraw Publishing Company, New York City
Frank W Smith, Vice-Chairman
The United Electric Light & Power Company, New York City

F M Feiker
W P Kennedy
C M Marsh
C A Street
C A Ward
E R Whitney

Garage and Rates

C H Miles, Chairman
The Edison Electric Illuminating Company of Boston, Boston, Mass.

E P Chalfant
Henry Harris
George H Jones
Bernard Lester
C M Marsh
C H Meeker
Walter Neumuller
Harry Salvat
F F Sampson
Willis M Thayer

Insurance

Day Baker, Chairman
41 Ferdinand Street, Boston, Mass.
W H Blood, Jr, Vice-Chairman
Stone & Webster, Boston, Mass.

A H Manwaring
C A Ward

Legislation

G A Freeman, Chairman
Walker Vehicle Company, Chicago, Ill.

Charles Blizard
E P Chalfant
Frank W Smith
Frank J Stone
H G Thompson
C A Ward

Manufacturers and Central Station Cooperation

George B Foster, Chairman
Commonwealth Edison Company, Chicago, Ill.
C A Ward, Vice-Chairman
Ward Motor Vehicle Company, Mt. Vernon, N. Y.

W H Atkins
J M Brown
F Nelson Carle
A C Downing
L A Ferguson
W A Fox
G A Freeman
W W Freeman
J D Israel
Fred M Kimball
F S Komp
James H McGraw
C E Michel
Frank W Smith
Clare N Stannard
Mathias Turner
Fred R White
E R Whitney

Membership

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Walker Vehicle Company, Chicago, Ill.
I S Hall, Vice-Chairman
Charles H. Tenney & Co., Boston, Mass.

R S Dunning
F C Gibson
N B Hazeltine
Taliaferro Milton
C A Ogden
J F Rogan
H L Schneider
H A Tewksbury

Motion Picture Film

Carl H Reed, Chairman
Electric Storage Battery Company, Philadelphia, Pa.

F Nelson Carle
S W Menafee
George D Smith
J M Wakeman

Standardization

E R Whitney, Chairman
Commercial Truck Company of America, Philadelphia, Pa.

H S Baldwin
E J Bartlett
Bruce Ford
H R Smith

Traffic and Good Roads

A C Downing, Chairman
Anderson Electric Car Company, Detroit, Mich.

Transportation Engineering Committee

F M Feiker, Chairman
The Electrical World, New York City

E J Bartlett
Charles Blizard
J B N Cardoza
C K Chapin
George B Foster
G A Freeman
Fred R Jenkins
E S Mansfield
A Jackson Marshall
Charles H Miles
H H Norris
Frank W Smith
George Drake Smith
Willis M Thayer
Charles A Ward
E R Whitney

TECHNICAL AND HYDRO-ELECTRIC SECTION

Officers, 1918-1919

R J McClelland, Chairman
Electric Bond and Share Company, New York City
H A Barre, Vice-Chairman
Southern California Edison Company, Los Angeles, Cal.
J E Davidson, Vice-Chairman
Nebraska Power Company, Omaha, Nebr.
J T Hutchings, Vice-Chairman
Rochester Railway & Light Co., Rochester, N. Y.
W C Anderson, Secretary
N.E.L.A. Headquarters, New York City

EXECUTIVE COMMITTEE

Officers, Committee Chairmen and

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I E Moultrop
H H Scott
Thomas Sproule

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R F Schuchardt, Chairman
Commonwealth Edison Company, Chicago, Ill.

H Carl Albrecht
R E Burger
H W Eales
L L Elden
H L Fullerton
S B Irelan
L M Klauber
G L Knight
A H Lawton
S J Lisberger
A S McDowell
A A Meyer
J F Neild
G E Quinan
E A Quinn
F E Ricketts
H H Rudd
N H Stahl
R H Tapscott
M O Troy
H L Wallau
W K Vanderpoel

Meters

F V Magalhaes, Chairman
The New York Edison Company, New York City

A S Albright
R M Boykin
F H Chamberlain
J S Cruikshank
B Currier
C G Durfee
Wm Eichert
C P Garman
F R Healy
C H Ingalls
C J Kellam
Otto Knopp
J C Langdell
M H Pittman
C O Poole
C J Theleen
A G Turnbull
Wm Volkmann
W L Wadsworth

Overhead Lines and Inductive Interference

A E Silver, Chairman
Electric Bond and Share Co., New York City

R L Baker
Markham Cheever
R D Coombs
A A Dion
E D Edmonston
John B Fisken
H B Gear
R H Halpenny
T F Johnson
T O Kennedy
J C Martin
W E Mitchell
W T Morrison
B E Morrow
C B Oliver
C S Ruffner
Thomas Sproulf
John B Taylor
W R Thompson
W K Vanderpoel
J E Woodridge

Prime Movers

N A Carle, Chairman
Public Service Electric Company, Newark, N. J.
R D DeWolfe, Sec'y

C M Allen
A D Bailey
E J Billings
W E Carter
R E Dillon
P M Downing
Louis Elliott
W W Erwin
J M Graves
H Harisberger
J B Klumpp
H P Liversidge
I E Moultrop
A J Macdougall
F D Nims
G W Saathoff
E H Tenney
O G Thurlow
J A Walls
John Wolff
H P Wood
R J C Wood

Underground Construction and Electrolysis

E B Meyer, Chairman
Public Service Electric Company, Newark, N. J.

H B Alverson
W H Cole
L L Elden
L A Herdt
F B Lewis
L T Merwin
A A Meyer
H N Muller
J B Noe
R C Powell
W E Richards
F E Ricketts
D W Roper
L S Streng

OPENING OF THE CONVENTION

MINUTES

First Session

The Forty-second Convention of the National Electric Light Association was held on the Million Dollar Pier, Atlantic City, New Jersey, May 19th to 22nd, 1919.

TUESDAY MORNING, MAY 20, 1919

The President of the Association, Mr. Walter F. Wells, of the Brooklyn Edison Company, called the meeting to order promptly at 10 A. M. and said:

In opening this Convention I might say that our reason for coming to Atlantic City was based upon past experiences. We have been here a number of times, and have always received a most cordial welcome. This welcome has come not only from the Hotel Men's Association, but from the people of Atlantic City, who have done everything in their power to make our stay pleasant and agreeable. This, also, in a great measure has been due to the very popular Mayor of this town, and I consider it a great honor, as well as a great pleasure, to present to you at this time His Honor, Mayor Bacharach. (Applause.)

ADDRESS OF THE HON. HARRY BACHARACH

I assure you it is a great pleasure, as you must know, to welcome you gentlemen to this great city of ours. You represent a great industry and have done most wonderful work during the war period. There is not one of you, as there is not one of the really true big business men of this country, who has not made wonderful sacrifices in his business, and who was not willing to do anything he could for the benefit of the country. I assure you that it is a pleasure to have men of your type visit our city and to welcome you here. I know that at this Convention you will have great problems to solve in the reconstruction work which is confronting our country at the present time—problems as great, perhaps, as those you have solved in the past.

We, as you well know, are mighty proud of our city and its magnificent boardwalk, one hundred feet wide and five miles long, where at times a quarter of a million of people promenade at one time. We are proud of our clean and well-lighted streets. We are proud of our Police Department and our Fire Department, and we are proud of our magnificent hotels where, we believe, people get more for their money than in any other place in the country. But, above all that, we are proud of the type of American citizen that resides in our midst. We in Atlantic City do not want as residents of our town, and do not permit to remain here, men who are not one hundred per cent American citizens. (Applause.) We do not want any conventions, anxious as we are for conventions, save those whose membership represents one hundred per cent Americanism. We believe that the men in this country who are not willing to fight and die for our flag, who are not willing to stand for everything that flag represents, should return to the lands whence they came. (Applause.)

And in this great city of ours, the playground of the world, the great convention city of America, where our business is nothing but entertaining—with no manufacturing interests—there has never been a drive of a patriotic nature but Atlantic City "went over the top." From this city we gave 3,500 of our brave young manhood to fight for your country and our country, and tomorrow as two of our magnificent companies come from over the sea, we can look them in the eye and say: "As you went over the sea to fight for our country, we who remained here looked after your dependants, not in a mean and miserly manner, but we took charge of them as the dependants of the soldiers and sailors of the United States should be looked after." (Applause.)

We are proud of this flag of ours, representing, as it does, that its stripes shall be forever thirteen and that one of those stripes represents our great state of New Jersey. We are proud of this because, as you all know, were it not for Atlantic City, New Jersey would be unheard of. (Laughter.)

This war, in my opinion, has accomplished and will continue to accomplish great things. I believe the question of labor and capital finally will be more easily settled, also the question of differences of opinion between different religious denominations, for on the other side they met in the trenches and on the field of battle, and considered not what a man's religion might be, but whether he was a true American and would carry forward the Stars and Stripes.

And as to your Convention, I want to present to you not only the key of Atlantic City, but the key of the hearts of the people of Atlantic City. (Applause.)

PRESIDENT WELLS: Mr. Mayor, in the name of the Association I desire to thank you for the kind welcome you have tendered to us here.

(The Mayor then left the hall.)

VICE-CHAIRMAN BALLARD: Ladies and gentlemen, it is my pleasant privilege to present to you formally our President, Mr. Walter F. Wells, of Brooklyn, who will now address us.

CONVENTION ADDRESS OF PRESIDENT WELLS

A year ago today the great German offensive which began the previous March was still progressing with seemingly resistless force, and grave doubts existed in the minds of all as to the ability of the allied armies to stop the march on Paris. Little did we think, two weeks later, when the American Marines first held and then turned back the German forces at Chateau-Thierry, that it was the beginning of the end. Until that time the German advance had been continuous, but from that date they began to weaken and then began the retreat which continued until six months ago, when the armistice was signed.

Today, we cannot honor too highly the brave men who offered their lives, nor the brave mothers who offered their sons in the great cause, nor should we fail to give due credit to those who gave up their vocations to serve their country or to professional men and others who devoted their entire energy to the work behind the lines.

At last year's convention we passed a resolution to "pledge all that we have and all that we are to the holy cause." From that time until the armistice was signed we as individuals, or as corporate entities, used our best endeavors in following out this pledge. Since then we have been working to readjust our business, not to the pre-war basis, but to an entirely new basis in which there are many unknown factors. As we were able during the war to meet and solve the unforeseen problems presented, so we will now go forth in the same spirit and cope with those that are to come.

During the past year your officers and committees have endeavored to make the Association work conform with the ever-changing conditions presented from day to day. During the first six months all but the most essential Association work remained at a standstill, and our members devoted their energies to the service of the Government. As suggested by the Chairman of the Public Policy Committee at our last Convention, our motto was "Service First"; cost, efficiency, and all other considerations being secondary.

Some of the work considered essential was that of the Lamp Committee, which, under the chairmanship of Mr. Smith, cooperated with the Government by collecting and disseminating information productive of economy in the use of artificial lighting and the limitation of inefficient carbon and gem lamps.

The Committee on Gas and Electric Service, with Mr. Lieb as chairman, maintained an office in Washington and rendered most valuable aid both to the Government and our member companies in connection with such matters as those relating to fuel supply, extension of service and priorities.

Our membership in the United States Chamber of Commerce gave us additional opportunity for cooperation with industries other than electrical in connection with war work, and will be of immense advantage in working out reconstruction problems in the future.

A meeting of the Third Resuscitation Commission was held under the auspices of our Committee on Safety Rules and Accident Prevention, of which Mr. Eglin is chairman, and the resolutions adopted by this body at the meeting were given wide publicity. This committee also kept in close touch and cooperated with the Bureau of Standards at Washington on many matters affecting our members.

Various plans have been discussed for increasing the efficiency of the Company Sections, the activities of which have been limited by war conditions. In some cases radical changes have been made in the Section organization and scope of the work. These modifications have been studied by your Committee on Company Sections, and it has suggested amendments to our Constitution to meet the situation, which will be presented later on during this Convention. The aim has been to perfect a form of organization which will give the maximum amount of assistance to the employees of the Class A members.

The question of revenue for the Geographic Sections, which was brought up at our last Convention, has been studied with a view to equalizing conditions and yet provide sufficient funds to carry on our work. About one-half of our members are affiliated with Geographic Sections, which are entitled under the present Constitution to a rebate of 50 per cent of the fixed membership dues. Should additional Geographic Sections be formed on this basis, so that all members would have such affiliations, the rebates would amount to one-third of our gross revenue. This would make it necessary for the National body to increase or adjust the dues or else transfer some of its activities to the Sections. As our work broadens there is a growing opinion that certain features pertinent to a locality can be carried on better by the Geographic Section organizations, leaving with the National organization only such matters as are common to all parts of the country. The question of the organization of the work and the relation between the Geographic Sections and the parent body is one that should have careful consideration during the coming year, if our National Association is to maintain its present representative position in the industry.

Early in January the Executive Committee, on the recommendation of the Public Policy Committee, voted to resume all committee work and to restore as soon as possible the full measure of the activities of the Association, concluding the year with a comprehensive national convention. Although the time was short and all were busy in readjusting company affairs, yet the Section and committee chairmen and committee members took up the task with a determination to overcome difficulties and place the activities of the Association on a basis that would be a credit to the industry. The interest that has been aroused is shown by a registered attendance to date of 1700 members and guests, and how well the work has been planned will be indicated by the interest taken in the exhibition and in the meetings of the next three days.

At a recent meeting of the Executive Committee consideration was given to the need of the Association for a managing director, or some similar permanent officer with a limited technical staff to handle the important problems which are arising all over the country, as it was felt that the technical work of the Association was suffering from the lack of a continuing organization. A committee has been appointed to report on this matter at the first meeting of the incoming administration.

Upon the vote of the Executive Committee, application was made for membership in the National Industrial Conference Board, which application has been acted on favorably. This Board is the response to a demand for cooperation among manufacturers. It was organized to unify and centralize the efforts of industrial associations in studying and solving the economical problems of industry, and to take constructive action in respect to the issues vital to the welfare of all. The Board is composed of associations organized in the interest of the various manufacturing industries, such as cotton, wool, hardware, rubber, railway cars, etc., and its purpose is to promote the stability and prosperity of industrial America.

During the year our members have all had to contend with a rising scale of prices for nearly everything that enters into the cost of our service. Wages have been increased in all departments. The price of coal has been increased at the mines by Government orders. The freight rates have been increased by the Railroad Administrator. The prices of supplies of all sorts have been increased by the law of supply and demand. The cost of funds has been increased because of uncertainty as to the future and the necessary diversion of immense amounts of capital for Government purposes. It has been necessary to offer high interest rates to obtain sufficient funds to make extensions of plant and property required to maintain our essential service to the public.

In order to bear these burdens a number of our companies have obtained authorization from regulatory bodies to raise their rates, and others, owing to local conditions, have been enabled to meet the requirements by intensive development of existing plant, by curtailment of extensions for other than war purposes, and by utilization of reserves.

We are now entering upon a period where our past experience, deepest thought and best judgment will be required to determine our future policy regarding extension of business. The price of copper has declined to about a normal basis. Steel and building materials have decreased from the highest, but are still far above the pre-war basis, and many building projects are deferred on the general impression that prices will work lower. Taxes have not decreased but are continually increasing.

A fair return on the capital now invested in our business has been the basis of many arguments and much litigation, but additional capital can be obtained only by paying the price demanded in a market where the supply is limited. In calculating return, investors deduct for the income taxes which they must pay on other than Government securities; consider the past depreciation in the market price of long-term securities of unquestioned value, and allow for the increasing interest rates paid by local or federal governments to attract capital. The uncertainty of the future makes a short-term note at high interest rates probably the most favorable competitor with tax-free investments. In view of all this, it would be well for us, before developing business which will require extension of plant at present prices, to calculate carefully if the gross revenue will be sufficient to pay the wages of labor, as well as the wages of capital and the amortization of bond discount before interest rates return to more normal conditions.

These specific problems are all factors of one fundamental, psychological equation, to wit: "The revenue from contented customers shall equal a satisfactory return for labor and capital."

For notwithstanding the physical and financial factors, the important factors in the fundamental equation are psychological. The revenue from *contented* customers must equal the *satisfactory* return for capital and labor. The service we are rendering does not directly compete with any other service. No other form of lighting in home, store, office or factory can compare with that produced by electricity, and no unit of value exists by which the superiority of electric light can be measured. Our problem, therefore, of keeping our customers contented with our service and maintaining their good will is largely a matter of psychology. Good will, though unrecognized by the courts in rate cases, is one of our most valuable assets, and depends upon the manner in which we come in contact with the public.

Money, although very important, is only one of the factors of a satisfactory return for one's service. The college professor is often better satisfied with his stipend than a broker with five times the income.

While many of us have developed plans for the education of our co-workers, for the bettering of living conditions and the development of saving accounts, we must be prepared in the future to consider more carefully broad plans for the individual wage-earner or salaried employee upon whose loyalty and continuous satisfactory employment the success of our enterprise depends.

Wages of necessity must be reasonable; but with the reasonability of the wage there must be instilled in our employees' minds the feeling of participation in the profits as the results of his individual labor as well as permanent benefits to himself.

If we inculcate such ideas and adopt such practical plans as will embrace this principle, loyal, satisfactory cooperation will be assured.

Investors are satisfied with a return on their funds in inverse proportion to their confidence in the management and continued earning capacity of the corporation. Millions are invested in savings banks at 4 per cent, when some public utility securities cannot be sold at a price to net the investor 8 per cent. There is a great deal said about socialism at the present time, and a few Government officials now in power seem to believe that political advancement depends on unfair treatment of the corporations, yet the American public is intelligent and when truthfully informed as to conditions will see that capital invested in public utilities receives its just awards, the same as in industrial enterprises.

Our business is open to the most rigid inspection and regulation, and it is our duty to convince the customers we serve, as well as the owners of the property entrusted to our care, that we perform our duties in such a way as to furnish the best service at the lowest price commensurate with a safe and fair return on the investment. If our customers, employees and investors are satisfied, there is little danger that any political demagogue will endeavor to favor one at the expense of either of the others.

However, we should not overlook the bolshevik and radical socialistic element whose principles and practices are manifesting themselves daily among our population.

The strikes in the west, the recent bomb outrages and "May Day" activities indicate the tendency to radicalism which is filling this country, and which breathes the atmosphere of Russia and other countries where the pernicious doctrines of misrule and anarchy have grown and multiplied.

It is natural, with the success that has been attained by the leaders of the movement in a country like Russia, that bolshevism should endeavor to seek the rich and fertile field of this country to spread its insidious propaganda.

We must not belittle the strength or power of this radical socialistic element. Its strength is fostered in many cases by men and women of intelligence who devote their time, thought and energies to the success of the movement. The defeat of the plans of such an element can come only through the development of an opposition requiring equal intelligence and equal effort from many men and women.

How this can best be brought about is an important and appropriate subject for us to study. Great organizations such as this can well take the initiative in combating the demoralizing influences of this element by propaganda founded on the lines of correct living and good government.

I, therefore, urge upon you for immediate consideration this question in order that definite steps may be taken to consider this matter seriously in cooperation with other national bodies in this country.

One of the problems particularly pertinent this year is so-called municipal ownership of utilities, but by which is meant, in nearly all cases, government administration rather than ownership, that is, control by individuals or their appointees, elected by the vote of the commonwealth instead of by the vote of the security holders. At present, administrative officers of all public utilities are elected or appointed by those having financial interest in the property, and their income from the property depends upon the ability of the men they select to represent them. In the case of so-called government ownership, the plants are usually purchased with funds obtained by the sale of bonds to the same class of investors or capitalists who own securities in private corporations.

The administrators of the property, however, represent the voting population, a very large percentage of which has no direct financial or personal interest in or responsibility for the success of the undertaking. The old motto,
"Taxation without representation is tyranny,"
might be adapted to read,
"Administration without responsibility means confiscation"
and will normally result in ruin.

As we believe municipal ownership or administration is economically unsound and cannot redound to the mutual benefit of the consumers and the municipality, it is only proper that we should consider what steps are necessary to protect the present owners of the properties that we administer.

Public administrators may obtain control of our property in three different ways:

First—By total confiscation;

Second—By purchase with funds collected by taxation;

Third—By purchase with funds raised from sale of municipal bonds.

As to the first, our laws protect us at present, and only a small percentage of our present population would advise any such radical course. Such a proposition is not much of a menace today, but we should be on the lookout to prevent any spread of the extreme socialistic or bolshevistic ideas.

As to the second, the purchase of our properties, even at a price which is far below the fair value, with funds collected from taxpayers, is not attractive to the public, as the burden falls on the present generation of direct and indirect taxpayers. The taxpaying voters will at once see the disadvantage to the community in this plan requiring a considerable increase in taxes, and the weight of their opinion will tend to make unpopular any leader proposing such plan.

Under the third plan, bankers and investors may be induced to furnish the funds necessary to acquire property through the purchase of municipal bonds. The return from these bonds is exempt from the federal income and excess profits taxes and if the return from the venture is not enough to pay the interest, the deficit may be imposed on the taxpayers. These bonds, therefore, seem to be a very attractive investment. If the city is not near its debt limit this plan is usually favored by voters, as the increased interest and sinking fund charges and actual deficits in operation are difficult of identification under some present methods of municipal accounting. Under this plan, the rosy promises held out by office seekers do not reveal their weaknesses for several years.

As our Association is educational in its character, we should devote our efforts during the coming year to showing the taxpayers the danger of incurring such debts and the bankers and investors the dangers of marketing large blocks of municipal bonds, issued for the acquiring of utilities that can be administered more economically under government regulation by private interests than by public officials selected by the popular vote of the people.

We should point out that the credit of municipalities and security of bonds heretofore issued by them will be affected adversely by additional issues of securities for the purchase of properties which may not continue to be self-sustaining, if they continue to sell their product at the prices now charged by privately owned companies.

By the transfer of the utilities to public ownership the Government not only loses the taxes paid by the corporation and by the owners of its securities, but may have to increase taxes in case utilities are operated at a loss or in case expenditures are unwisely made, as well as pay higher interest rates demanded by investors as the amount of debt per capita increases, as the municipality approaches its debt limit, and as the federal tax exemption features become less valuable.

We can use as examples of the results of public ownership the railroads, the merchant marine, the express, telegraph and telephone companies, which under present government administration have not only increased rates for a service much inferior to that furnished in the past, but which on account of continuously increasing operating cost may still further increase the rates to the public.

The recent utterances of Mr. Charles E. Mitchell, president of the National City Company of New York, on government operation of railways, calling attention to the billion-dollar shortage in operation for the year and his statement that the railroad financial situation is far worse than it has ever been before, indicates that bankers are beginning to realize the arguments against government ownership or operation which we have promulgated for years.

Mr. F. H. Sisson, vice-president of the Guaranty Trust Company, recently made the statement that if "unwarranted additions are continuously made to the tax burdens of our communities, the bonds of our municipalities will not be attractive to bankers and investors, and the growth and prosperity of cities will be seriously threatened."

Last year our prime duty was to render service to the Government, and we willingly pledged ourselves to give all that we had and all that we were to the winning of the war and establishment of peace. Today the war is won and the peace treaty is nearly ready for signature.

From now on our particular duty is to the people. Our duty to that part of the people who are our customers is to render them satisfactory service. Our duty to those who are our employees is to maintain loyalty by fair treatment. To those who own our securities it is to maintain the integrity of their investments. Our duty to the others of the commonwealth under whose rules and regulations we operate is to furnish convincing information that we are giving them a better service for less money than can be obtained in any other way.

Our business is founded on an economic basis, and, if wisely administered and not hampered by unfair treatment, can continue mutually beneficial to the customer, labor, capital and the commonwealth.

THE VICE-CHAIRMAN: The Chair will appoint as a committee to consider the President's Address and report its findings at a subsequent session Mr. Charles L. Edgar of Boston, Mr. John F. Gilchrist of Chicago, and Mr. J. E. Davidson of Omaha.

(President Wells in the Chair.)

THE PRESIDENT: The Secretary has some announcements to make.

Acting Secretary Sewall read the following telegram:

SAN FRANCISCO, CAL., May 16, 1919.

R. H. BALLARD, Vice-President,
National Electric Light Association, Atlantic City, N. J.

Please convey to your Convention the felicitations of the Pacific Coast Section N.E.L.A. and cordially invite members to be present at the most enthusiastic of all electrical conventions ever staged in the West, April, 1920. We feel that contact between the East and West among members of the electrical industry is of vital importance and you can promise that matters of such timely interest will be discussed as will justify Eastern delegations coming West to our Convention at that time.

E. A. WISHON, President.

Acting Secretary Sewall also read the following telegram:

Chicago, Ill., May 19-1919.

W. F. Wells, President,
National Electric Light Association,
Atlantic City, N. J.

Very much regret that owing to the delay in my return home from Europe it is impossible for me to be at the Convention of the National Electric Light Association this week. Please convey my regrets to my friends. I hope that the Convention will be a very great success.
Samuel Insull.

Acting Secretary Sewall also read the following announcement:

"Mr. E. P. Edwards, chairman of the wireless telephone demonstration of wireless telephony, announces that wireless telephone communication may be had between the Million Dollar Pier and the Steel Pier at any time during the Convention. This is in addition to the times previously set for demonstrations of wireless telephony."

W. H. Johnson, Philadelphia, Pa.: There will be no member of this Association more missed from this Convention than Mr. John W. Lieb; we miss his kindly manner and helpful suggestions, and the wonderful store of information that he always gives at every Convention. I therefore move that a committee of three be appointed with power to send Mr. Lieb a telegram forthwith, at the beginning of this Convention, expressing our sympathy with him in his illness and good wishes for his speedy recovery, and that the telegram be spread on the minutes of this Convention as a part of the proceedings.

The President: Gentlemen, you have heard the motion. I know we will all miss Mr. Lieb very much. He has been the heart and soul of this Association, as well as of other associations, and in putting this motion I am going to ask all who are in favor of it to please signify by a rising vote.

(The motion was unanimously carried by a rising vote.)

The President: I will appoint Mr. W. H. Johnson, Mr. W. H. Atkins and Mr. Martin Insull as said committee.

In accordance with our regular practice, I will appoint as sergeants-at-arms during the Convention Messrs. Anderson and Marshall of the Association, and Mr. Millar of the Electrical Testing Laboratories.

We will now have the report of the Acting Secretary, Mr. S. A. Sewall.

REPORT OF THE ACTING SECRETARY

While the activities of the Association committees were very much curtailed during the first half of the administrative year on account of the war, soon after the armistice the demand for pre-war activities was so strong that the Executive Committee at its meeting on January 10, 1919, gave the order for full steam ahead. During the time from January 10 to May 15, 1919, a total of seventy-five committee meetings were held with a combined attendance of 1127. These committees have prepared forty-three papers, which have been printed for this Convention.

The general work of the office has been very active both during the war and after the armistice, handling a great deal of correspondence, as many of the smaller member companies called for assistance of all kinds and through the Information and Data Department we were able to render considerable help. During the year we have had four hundred specific requests for help and information; we have issued 1700 handbooks and over 12,000 miscellaneous publications. While the size of the BULLETIN was materially reduced, there were issued about 130,000 copies, and of the 1918 Convention Proceedings 9500 copies were distributed.

The *Rate Book,* which now contains the rates of all cities serving a population of 25,000 and upwards, is very much in demand and is practically self-supporting. We now have 614 subscriptions. *Rate Research* still holds its own with a subscription list of 338.

The Commercial Section now has several very attractive publications which it is offering to the membership.

With the impetus which the present Convention will give to the work of the Association it is evident that its activities will more than keep pace with the demands of the reconstruction period.

THE PRESIDENT: The next number on the program is the report of our insurance expert, which will be presented by Mr. W. H. Blood, Jr.

REPORT OF INSURANCE EXPERT

The title "Insurance Expert" conveys but little conception of the functions of the office. A brief review, therefore, of the causes which led up to the creation of this position, together with a short history of achievements, is especially opportune and fitting, as the first decade is drawing to a close since the creation of the office which the present incumbent has filled continuously.

Ten years ago the National Electrical Code (Underwriters' Code) was, with the rapid progress in the art, undergoing constant change and it became apparent to the officers that the National Electric Light Association should be represented by some one in attendance at all of the conferences. When changes were considered it was necessary to see that no rules were adopted which would retard the development of the electric light and power industry. There were, moreover, tendencies at that time toward the introduction of rules materially increasing the cost of electric wiring and in turn tending to prevent the wider uses of electric light and power. At the same time it was evident that many of the rules were susceptible of modification so as to reduce the fire hazard.

In order to secure intelligent cooperation with the Underwriters, your officers thought it advisable to obtain the services of one familiar with the installation of wiring systems and with the construction and operation of electric light and power plants. As a result the writer was selected and the position of "Insurance Expert" created to fit the case.

In the process of evolution the Underwriters' Electric Association, which had been responsible for the National Electrical Code, was dissolved, and the work formerly undertaken by it was taken over by the Electrical Committee of the newly formed National Fire Protection Association. Representatives of all of the electrical associations of national character were included on this Committee. Your Insurance Expert has, as a result, represented the National Electric Light Association on the Electrical Committee since it was formed. He has also served on many of the sub-committees, has attended all of the meetings and has

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Manuscript of this report was received April twenty-fourth.

been active in all matters connected with the electrical work of the Association.

That it is necessary to have some one on the watch for undesirable rules is evident from the fact that from year to year many proposed changes have come up before this Electrical Committee, which, if they have been passed, would have hurt the electric industry materially. These injurious rules have been resisted by your representative, and in general his suggestions have had due consideration by the Electrical Committee. Our relations have been, and I see no reason why they should not continue to be, most harmonious. The National Fire Protection Association has recognized and emphasized the desirability of having the Electrical Committee composed of men who have the time and inclination to represent continuously their respective associations, men who are familiar with the historical formation of the rules and who are so closely identified with the organizations which they represent as to be able to speak with some authority.

For many years the National Electrical Code was revised biennially in open meeting at which there was free discussion, a vote being taken on each proposed change. This method of procedure furnished no opportunity for the consideration of changes in the Code, except for a short period just prior to these meetings. This resulted in a large amount of rush work just before each meeting, and for the remainder of the two-year period there was practically no opportunity for consideration of any matter that might come up. A proposed change which was not approved in the open meeting had to lie over for two years. There was also no provision for permitting the use of new apparatus or trial of novel wiring systems even on a tentative basis.

A change in procedure, however, has been brought about. Under the present arrangement the work of the Electrical Committee, as a whole, is to be conducted by two classes of committees to be known as standing committees and technical sub-committees. The standing committees are what might be termed "steering committees" or "committees of initiation," and they are largely responsible for the future of the National Electrical Code. Associated with them are to be technical sub-committees to which detailed investigations are to be referred. By this arrangement, continuous performance is expected, although, as previously, changes in the code can be expected only once in two years. Investigations and recommendations, however, will be always under consideration. A committee is also to be appointed to deal with the subject of new appliances and novel systems of construction.

Under present arrangements it is expected that all suggestions to be presented to the Electrical Committee will come through the accredited representative of one of the national organizations forming the Committee. In this way the many hastily conceived suggestions coming from irresponsible individuals should be eliminated. The biennial public meeting will be continued, but will hereafter be in the nature of a hearing, and any vote taken then will be considered simply as an expression of opinion and will not necessarily be binding upon the Electrical Committee. The Electrical Committee will meet after the hearing and make its own definite recommendations to the National Fire Protection Association, of which organization it is a part.

It is intended that representatives of the National Electric Light Association shall serve on some of the technical sub-committees in order that they may furnish operating experience. If any members of the Association are especially interested in any of the subjects covered in the Code, or know of men who are peculiarly well qualified to act upon these sub-committees, your Insurance Expert should be informed of them. This will be of great assistance in the formation of the committees, will help to establish rules which are in accordance with recognized practice and will naturally bring about a closer cooperation between the National Fire Protection Association and the National Electric Light Association.

A few years ago whenever there was a fire which by any forced conclusions could be attributed to electrical causes, it was common practice to attempt to make the electric light company which furnished the current stand the loss. This resulted in the bringing of a great many suits against electrical companies on the ground of negligence. Such cases were frequently brought at the instance of insurance companies, and because of the familiarity of their attorneys with the conduct of such cases and the unfamiliarity of the attorneys of the electric companies, verdicts were often secured against the lighting companies. The officers of the National Electric Light Association, realizing the seriousness of such situations, called upon your Insurance Expert to assist member companies in resisting such suits. Your Insurance Expert has, therefore, for a period of years been very active along these lines and has rendered assistance to the companies thus attacked by outlining the nature of the evidence necessary for defence; by submitting, to the local attorneys, references in court decisions; by instructing these attorneys in electrical matters; by assisting them in determining the actual cause of the fire; by examining the witnesses for the trial and by acting as general adviser throughout the case, frequently serving himself as an expert witness. As a result of this procedure, comparatively few suits have been brought during the past few years, and it is most gratifying to state that in every suit into which your Insurance Expert has been summoned since his office was created no decision has been rendered against a member company. A belief that this record can be continued indefinitely is of course not to be expected.

Since the last report was submitted by your Insurance Expert, several important cases have been handled in a manner approximately as outlined above. One of them was in the nature of an arbitration proceeding between the New York, New Haven and Hartford Railroad Company and the Adams Express Company which was heard before the Honorable William H. Taft, as Arbitrator. The Railroad Company's station at Hartford, Connecticut, was largely destroyed by fire and the Express Company asserted that the fire was due to electrical origin. This loss was approximately $300,000. Testimony was introduced, as usual, to show that the fire was hottest on the ceiling of the building where the electric light wires were located. With this as a starting point, an ingenious theory was worked up to show that the fire originated on the wires through the leakage of high tension current which jumped various gaps and went through 110 volt fuses, switches and meters without injuring them. The theory was full of weak links and supposition rested upon supposition. Your Insurance Expert gave his usual services in this case, acting as an expert witness, and he has the pleasure of reporting that Judge Taft decided that the fire was not of electrical origin.

In another case where suit was brought against the Harwood Electric Company of Hazelton, Pa., an attempt was made to show that the fire was caused by the negligence of the Company in allowing 2200 volts to get into a mill, thus causing a loss of some $25,000. Your Insurance Expert, assisted in establishing the method of procedure, helped in the examination of witnesses and finally testified in this case. It was proved that 2200 volts did not get into the mill and that besides numerous other possible causes, an electric fire might have been started by 220 volts, due to the defective wiring installation of the customer. The trial judge handed down an opinion directing judgment in favor of the Harwood Electric Company. It is no exaggeration to say that the accurate presentation of the electrical details of this case (as the judge was unusually well posted on electrical matters) was the determining factor in the decision.

In another important case tried in Martinsburg, West Virginia, the claim was made that an employee in a dyeing establishment was killed by a 2200 volt current furnished by the Potomac Light and Power Company. In this case your Insurance Expert assisted in the preparation of the line of evidence necessary, in securing the desired witnesses, and also in giving expert testimony. The weight of the evidence showed that the man received neither 2200 volts, nor even 110 volts used on the lighting circuit, but met his death by a blow on the head occasioned by a fall. The verdict of the jury in this case was in favor of the Potomac Light and Power Company. The case was fought hard and was won only by superior handling and intelligent presentation of the electrical features. Since the decision, however, new evidence has been presented and the court has set aside the verdict of the jury and ordered a new trial. The Company's attorney, however, has applied for a writ of error and the case is now pending in the Supreme Court of Appeals.

Your Insurance Expert has been in correspondence with many member companies; has given them desired information in the matter of ratings and improvement of risks; has furnished many technical details in reference to the best type of construction and has outlined what constitutes standard practice. The service rendered by the Insurance Expert is necessarily intermittent, but, as is obvious from the above report, it frequently calls for several days, sometimes weeks, of uninterrupted time, and is supplemented by almost daily routine matters needing prompt attention.

Your Insurance Expert again offers his services to all member companies and, in order that no precedents may be established against this industry, suggests the desirability of consulting him in reference to all suits instituted on account of electrical fires. He also desires to secure the closest cooperation of all the member companies with reference to improvements in the National Electrical Code, in order that these rules may be drafted with due reference to the best engineering practice and economy.

THE PRESIDENT: If anyone desires to ask Mr. Blood any questions on this Report, or to say a word in discussion of the same, the opportunity is now open. (No response.) If not, we will proceed to the next number on our program, which is "Report of Rate Research Committee," which will be presented by Mr. Alex Dow.

REPORT OF CHAIRMAN OF RATE RESEARCH COMMITTEE

The Rate Research Committee held no stated meetings last year. It continued the publication of *Rate Research* and the *Rate Book* and answered such questions as came to its Chairman or to its members by direct correspondence. When these questions were of general interest, notice was taken of them in the BULLETIN. In most cases the answer would have been found in *Rate Research* had the inquirer read that publication regularly. Moral—subscribe to *Rate Research.*

That publication just about breaks even. Its effect on rate practice, through furnishing information to State Commissions, as well as to our own members, is unquestionably valuable. There is a distinct reduction in the arising and holding forth of cruel and unusual rate theories and rate schedules.

The *Rate Book* as a financial proposition does not break even, but the deficit is not so big as we thought it would be. The value of the *Rate Book* is unquestionable when a company is actively studying rate problems. Its general usefulness, as compared to the weekly publication of *Rate Research,* is doubtless much less. We have had several suggestions as to betterment or as to extensions that might be made in the *Rate Book,* but we would rather see its publication continued for a year or more, on the present plan and under normal business conditions, before we attempt either to better it or withdraw it.

Now as to the peace-time work of the Committee. During these years of war all we could do was to watch and make record of the evolutions of the subject—a subject changing in its color and scope almost daily during that period. Our record has given us much material for study. It has given us no new rate theory, neither any new rate method. Indeed, I do not look for either of these.

A few remarks are in order at this time, in advance of the detailed study for which we are now having opportunity. The use of a surcharge rather than an alteration of a rate schedule is a war-time expedient, of which the motive is obvious. It is intended to make clear the belief of the Commission that war-time costs are only temporary. That they shall be temporary is our hope, but I now remind you that costs have not yet gone down; that the conditions that warranted rate increases and surcharges remain with us; and that the period of readjustment is not likely to be a period of rapid regression in costs.

Another rate method which has had considerable vogue is the use of a coal clause, so called, recommended some time ago by the Rate Research Committee as specially applicable to large contracts. The coal clause method has been given, in some cases, a wider scope than that recommendation contemplated. How the clause has served its purpose during the war is a matter of interest, but how it will work in contracts continuing during peace time is a matter of greater interest. It is going to be difficult to keep it impressed upon our customers that coal costs have not yet definitely gone down and may not go down. Also, the Committee's former warning of possibilities of disputes with customers, who may challenge the good faith of the company in its statement of coal costs, is a warning of even more importance today than it was during the period when coal costs were officially fixed. Remember that what seems a simple matter to those companies which buy, f.o.b. barge or cars, their year's supply of coal at a contract rate, and can offer the contract as evidence of costs, is a very complex matter for those companies which had to go into the open market in order to make good contract deficiencies, or have had Fuel Administration supplies wished upon them during the last months of that late-lamented Administration, and which still have those supplies which may be excessive in quantity and undesirable in quality. The policy of wisdom will be the policy of guessing in advance what explanation will be required, and then, if possible, avoiding the explanations.

Another clause which had an increased vogue during the war period was the Power Factor clause. Everybody who has it says it is all right; but I sometimes think that these professions are like those of the fellow who married the wrong girl and just dared not acknowledge it. While the Committee has recommended the use of a Power Factor clause and pointed out the equity of it, that recommendation gave the warning that the clause should either definitely be a penalty clause intended as a deterrent or it should be a very carefully worded cost clause intended to graduate the rate according to increased costs resulting from poor power factor. The distinction between these two methods must be recognized and observed.

Other committees of the Association are dealing with methods of power factor determination, of metering and even terminology, and the work of these committees will in due time be helpful and will be received with great satisfaction by the Rate Research Committee. The relation of our Committee to all of these junior committees requires a word or two. Our work necessarily touches on that of the Meter Committee. It also touches upon that of the commercial sales committees—thus a two-part method, intended to encourage the long use of current, is, because of its purpose, a matter for the consideration of the Commercial Section. Again, when we study the question, either for our own information or to enable us to answer the conundrums which are asked of us, as to why in one territory rates for one class of service, say lighting or power, should be relatively high and the other class relatively low as compared to exactly opposite conditions in some other territory, we find that we run into the province of the Accounting Section and into the very dubiously lighted and very much wire-entangled "No Man's Land" of the apportionment of costs to classes of service. And having each of us, individually, and all of us as a committee, rather burned our fingers and torn our clothes in such explorations, we are shying from consideration of that interesting subject, and are quite willing to leave it to the enterprise of our junior committee.

Our attitude therefore is that our duty is to study rate-making methods, to furnish information thereon, and in due time to correlate the work of these other committees with our own.

(Signed) ALEX DOW, *Chairman.*

THE PRESIDENT: This subject is now open to general discussion, and we would like to have the members discuss it and bring up any points on which they desire information.

FRANK W. SMITH, New York: It seems to me the membership of our Association is not taking full advantage of these publications—*Rate Research* and the *Rate Book*. I believe the work of Mr. Dow's committee represents one of the important activities of the Association, and that these publications should be made entirely self-supporting. This can easily be done if the number of subscribers is somewhat increased.

We now have a few over 600 subscribers to the *Rate Book,* which, as you know, is a publication giving a synopsis of the rates and conditions of service of our member companies. There are three supplements issued annually, which keep the information up-to-date and make this publication a very valuable reference work. We should have, I believe, 300 or 400 additional subscriptions, and I think the members of the Association will find the book of great usefulness, as it provides an easy way to determine the general rates and service conditions of our member companies throughout the country.

The value of the Rate Research bulletin issued weekly is self-evident. There are now only about 330 subscribers to this publication, the number having materially lessened during the war period. I think the subscriptions to that publication should be increased so that Mr. Dow's committee, through the assistance given by additional subscriptions, will be able to make this important publication self-supporting.

The President: Is there any further discussion?

M. C. Ewing, Wausau, Wis.: I would like to ask Mr. Dow if we are to understand the Committee as recommending that we are not ready at this time for a power factor differential in our rates.

Mr. Dow: I briefly endorse what Mr. Smith has said. Our weekly publication, *Rate Research,* costs but little. The subscriptions are some 330 odd, which is only a small proportion of our Class A membership. We should have subscriptions from our larger companies, or companies having divided management, sufficient to give every division a copy of *Rate Research.* It is intended not only for the President or Counsel or General Accountant, but it is of value to every officer and every division.

As to the power factor problem: it is easy to get along with an educated customer who has electrical knowledge, or good technical advice, and who is a reasonable person. It is still more easy to persuade a customer to keep a better power factor when he can be shown that in failing to do so he is neglecting his own interests. But remember that we serve the general public and that the users of alternating current motors are legion, and that every man of them buys his motor "a little bit big," so that he will have more power when he needs it. Remember also that it is the multiplicity of these small motors, each a little bit big, that makes the bad power factor on most of our systems and that to the ordinary motor customer power factor is something he does not know about and does not care to know about.

CHARLES R. PRICE, New Bedford, Mass.: What arguments can you use to induce a man with a sawmill who wants to put in a 100-h.p. machine and refuses to listen to our reasoning in favor of several smaller machines because they will cost him $200 or $300 more, even though they will save him in current charges? Is there any more persuasive thing than to charge a higher rate?

VICE-PRESIDENT BALLARD: Do you in your research, Mr. Dow, find the public has taken as well to regular increases in rates as to surcharges? How have the two, relatively, been received?

W. L. ABBOTT, Chicago: I should like to ask Mr. Dow if his Committee would recommend the installation of devices for correcting the power factor in cases where it is extremely bad? That may not be the function of his Committee, but I think he can qualify as an expert on it. (Laughter.)

MR. BENNETT: If we were to make a penalty for bad power factor, should we not have a bonus for good power factor? And what work has been done in that line, if any?

THE PRESIDENT: Mr. Dow, I think the catechism is finished. You may take hold now.

MR. DOW: I would like to call to the attention of the Chairman and the Executive Committee the fact that not one of those questions which I am invited to answer belongs to the Rate Research Committee and that, therefore, the answer to each of them must be considered personal rather than official. The Rate Research Committee can pass the buck just like a Government department.

The answer to Mr. Price's question is that he will have to put the fear of God into the fellow who sells those motors. He must say, "If I catch you over-selling to my customers I will show you up as an unprincipled profiteer." Every person selling motors naturally wants to make the biggest sale or the biggest commission. To counteract him Mr. Price must convince the customer that he can buy a smaller motor today and later can trade it in at a fair price for the larger motor which he expects and hopes he will soon need. If you cannot convince him of that your case is hopeless. On the other hand, if you have a ready exchange of motors, even at a small loss to yourself, you will do much good.

Mr. Ballard's question was as to the acceptance by the public of the surcharge, rather than the definite increase in rate. The one great joy about this war is the way in which the American public has given up its freedom of action and has come forward on the call of every responsible or irresponsible authority to do the right thing towards winning the war. I think the public accepts the surcharge as an incident of the war—as an unavoidable tax on society.

As to power factor correction devices, much can be done to encourage the use of the synchronous motor. The small synchronous motor, perhaps not as small as 50 horsepower, but upwards from 50 horsepower, with a direct-connected exciter, is not an impossible manufacturing proposition if it were manufactured in quantities. Today if you go after a synchronous motor for some customer, you will find that it is something special and your customer is asked to pay 30 or 35 per cent more than for an induction motor. I see no reason for this great difference in price other than the lack of quantity production. You can convince the big customer, whose transformers and whose circuits within his own premises will thereby be reduced in cost, that he should pay more for a synchronous motor, but at the present difference you cannot convince the small customer.

The basic question as to a power factor charge today is, what is the wise division of cost of service between the company and the customer? You must answer this question by proving to the customer that it is worth his while to correct power factor, or you must apply enough correction to the system and distribute the cost through your rate over all the customers.

Another question was asked whether penalty for low power factor should be equalized by bonus for high power factor. What difference does it make? If you want leading current supplied to your system to cancel lagging current, you should pay for the leading current. It is theoretically immaterial whether you pay for it by a bonus proportional to the angle of lead or whether you hire the customer to run his synchronous apparatus with over-excitation; but the latter is likely to be the simpler way.

But let me repeat the point I made in my first talk, which is that you must distinguish between the two ideas as to rates intended to correct low power factor. One idea is that low power factor merely adds to the cost of the service, and therefore the increased cost of the service should enter into the rate as part of the total cost, before you begin to get your reasonable profit on the service. The larger idea is that poor power factor—needlessly, sloppily poor power factor—is a nuisance and ought to be penalized as such. The inherent difficulty with this large idea is that we all want the growth of our business which is anticipated to arise from the use of the smaller electrical furnaces in metal working and other applications of electric arcs whereof the power factor is essentially low. You have, when inviting the use of such devices on your circuits, to deal not only with the man who wants to sell to your customers a device having a needlessly bad power factor, but you have also to deal with the man who wants to sell devices which needlessly give you all sorts of unbalanced loads. You must face the fact that your public wants to be served and must be served, and you must distinguish in your rulings as to acceptable devices, and as to the use of these devices, between conditions which injure service to other customers and therefore should be specially penalized, and conditions which, if they be given too much importance, will compel your customer to purchase regulating and balancing apparatus which will needlessly increase his cost of running. You will have to say, in so many words, that apparatus having a power factor below a certain value will not be tolerated on your circuits unless the disturbance which it causes is simultaneously corrected at the expense of the customer. It is right that the customer desiring to use a public service should pay for the correction of intolerable conditions introduced by him. But you simultaneously have to acknowledge that low power factor is an inherent characteristic of electric power service by alternating currents, and that the correcting of the system conditions resulting from the use of such devices as can reasonably be tolerated is part of the total cost of the service.

Now as to whether you should put a penalty on very low load factor or pay a bonus for reasonably good load factor, let me ask why should we pay a man for being ordinarily good? If you penalize him for a power factor lower than, say, 70 per cent, you are thereby interfering with his freedom in order to protect the common good and your action is equitable. Between the man who should be penalized because he is spoiling service to his neighbor and the other extreme, where the man so operates his plant as to help his neighbors, there is such a wide zone of reasonable or normal alternating current practice that the penalty imposed upon the trouble-maker may be contrasted with or counter-balanced by a compensation to be given to the remover of the trouble. The equities applicable to the two extremes are obvious. But in the intervening normal zone I should hate to have to settle with each customer according to his mean or average power factor during the settlement period. By all means soak the sinner with an intolerable power factor. And the other case suggested—namely, a customer who will give you leading current to help out the general service—is one which you meet so seldom that you can deal with it on its merits and then go down the road to give something to the first poor man you meet because God has given you a kind customer. (Laughter and applause.)

THE PRESIDENT: Having heard from the rate end of the subject, we will now have the report of the Special Joint Committee on Determination of Power Factor in Polyphase Circuits, which will be presented by Mr. R. J. McClelland, Chairman. (Applause.)

REPORT OF THE SPECIAL JOINT COMMITTEE ON DETERMINATION OF POWER FACTOR IN POLYPHASE CIRCUITS

The subject of "Power Factor" has been prominent in the discussion this morning, although Mr. Dow has carefully avoided saying anything as to what constituted "Power Factor" or as to proper methods of determining it. It is to clarify the situation in regard to these points that this Special Joint Committee on Determination of Power Factor in Polyphase Circuits was established.

A number of men and organizations in recent years have given study to the power factor problem and one of the first things which develops in such a study is the fact that there is no generally accepted definition of the term "power factor" as applied to polyphase circuits, nor even as to the underlying purpose which such a definition should serve to express. This condition of uncertainty has arisen naturally from the fact that until recently there has been little practical commercial incentive to establish a universally accepted understanding as to these points.

This absence of practical incentive is due to the fact that most polyphase loads hitherto have been approximately balanced, while the differences between various possible definitions of "power factor" become of importance only in unbalanced loads. At present, however, there are increasing developments in types of industrial power loads which are attended by unbalanced conditions between the phases, unbalances as to amounts of loads and as to phase relations. In such cases the numerical factor may vary widely with different definitions.

The increasing commercial importance of this character of load and the tendency, as brought out at the discussion this morning, toward such refinements in power contracts and rates as will reflect accurately the various elements entering into the cost of service, have combined to render the problem a matter of immediate practical interest. The need for an authoritative understanding has resulted in this Special Joint Committee being formed between the American Institute of Electrical Engineers and the National Electric Light Association. This does not mean that the work of the Committee will be confined to these two associations. If other bodies or associations are interested and desire to participate in the work they will be welcome.

The subject has proved more involved and complicated than would appear on the surface, and our work thus far has consisted mainly of collecting a large amount of information from various sources as to possible definitions of "power factor." The divergency of views is rather astonishing. The subject is one of international significance and this Committee will coordinate its work with that of other bodies abroad.

The Committee's aim has been set very high, and it hopes to accomplish the following results:

First—To consider the purpose to be fulfilled in the use of the term "power factor" in the commercial engineering and scientific aspects of the electrical art.

Second—To offer for the electrical industry in the United States a definition which will definitely and correctly express this purpose and will be suitable for scientific, legal and commercial use.

Third—To study, probably in conjunction with the manufacturers, the best available means of measuring the function thus defined.

The Committee may possibly offer also certain suggestions or recommendations as to methods of providing for power factor in contracts and rates.

The Committee is small and the questions involved are of wide interest. We hope that anyone who has made any particular study of the subject or has any information which will be of assistance in carrying out the Committee's program will communicate with the Committee and take part in its meetings.

The Committee was organized in February of this year and held its first working meeting on April 10th. The next meeting will probably be held within two months. The present personnel is as follows:

R J McCLELLAND *Chairman*
FARLEY OSGOOD *Vice-Chairman*
S G RHODES *Secretary*
DR P G AGNEW
FRANK CONRAD
F P COX
F C HOLTZ
DR A E KENNELLY
E W LLOYD
G A SAWIN
R F SCHUCHARDT

GEORGE H. JONES, Chicago: I would like to call the attention of the meeting to the Power Sales Bureau session tomorrow afternoon. This matter of power factor will be discussed and those wishing to attend can bring it up.

W. L. ABBOTT, Chicago: I would like to ask, in connection with the charge for a low power factor, whether anybody has put in a meter to measure a straight flow ampere, and whether that has been used as a corrective device or punishment?

THE PRESIDENT: Any other questions?

PHILIP TORCHIO, New York: I would like to say a few words and address them especially to Mr. Dow and the Rate Committee, as they can aid a good deal in the work we have started. About a year ago I requested the Standards Committee of the American Institute of Electrical Engineers to prepare a definition of the polyphase power factor. This request led to the organization of a sub-committee to cooperate in the study with the National Electric Light Association. Lately I find that the International Electrotechnical Commission is also interested in the same subject which Mr. Dow has discussed.

With cooperation, the results of these engineering activities may be led to bring forward the results we want to accomplish. We must, however, make up our minds clearly on what is wanted, and this organization can do much in that direction. In this connection I would suggest that, while, as a method of procedure, it was opportune to approach the subject from the angle of defining the polyphase power factor, I submit that in the last resort we are not interested in measuring the power factor but the reactive energy of the circuit in similar manner as we measure the work energy. These two energies are definite quantities clearly defined by Institute rules and are easily measured. I believe that our manufacturers can and will, if we want them, and the Research Committee finds it advisable, devise a meter which will not be much more expensive than the present meter and which will give both the work energy and the reactive energy. If we then measure these two quantities it is a simple matter to apply a rate for the two energies. For instance, in a study made in Italy, where water power is predominant, they have found that the proper charge for these two energies would be approximately three for the work energy and one for the reactive energy. I imagine that where steam generation is involved the ratio, instead of being 3: 1, may be 5 or 6: 1, but the Rate Research Committee of this Association and the technical committees should analyze and determine what that value is.

I again emphasize that as a point of expediency we are in a position to secure prompt action and eventually lead the International Electrotechnical Commission, as well as the American Institute of Electrical Engineers, to stabilize on a definite basis the definition of reactive energy. In fact, on February 22d last the President of the French Electrotechnical Commission wrote to the General Secretary a letter suggesting giving a name to this reactive energy, which in our American Institute rules is now called "reactive volt amperes." I think we can get what will just suit the industry if we act promptly. We have the name of "kilo-watt-hour" for work energy and we need another name for the reactive energy—say, the "kilo-rice-hour." On this basis rates can be evolved to meet conditions. It does not mean that we have to apply these rates to every customer. It will depend on what the proper meter will cost, etc. If the meter does not cost more than the present meter, you will probably apply it to many customers and solve the problems which Mr. Price and others mention.

Mr. Dow: Answering the inquiry as to meters, I would say the Sheffield, England, municipal plant, which has had tremendous development during the war, and which has served a local as well as a national necessity, was possibly able to do things summarily which in time of peace it could not have done with less than fifteen letters to the *Times* and two acts of Parliament. (Laughter.) It has used recently a Hopkinson form of rate for energy supplied for mixed loads, including steel furnaces, in which the first charge is a fixed charge per kilowatt of demand, followed by a meter rate per kilovolt-ampere-hour. There is good argument for doing it the other way around—making a fixed charge per kilovolt-ampere of demand and a meter charge per kilowatt-hour. And, again, water power practice and steam power practice may find it desirable to differentiate. But without going into any complexities I suggest that what we might call the Sheffield idea might well be applied to the tremendously large portion of the power supplied in the United States by our member companies which is now served under the Hopkinson form of two-part rate.

As to means of metering our service so as to take power factor into account, as a member of the Institute of Electrical Engineers and as a member of another institution which has been discussing power factor from the point of view of the electrical engineer, I rejoice at the announcement of a device which will meter reactive energy separately from watt energy, and I also rejoice to know that some of our foreign friends have evolved and applied a rate method which includes the use of these metering devices. But as the manager of an electric light property—invited to consider the application of such a method—— (A gesture by Mr. Dow evoked laughter.)

Therefore let me say, once more passing the buck and standing from under, that the Rate Research Committee, two or maybe three years ago, pointed out that if utility commissions, guided by technical officers or possibly by the United States Bureau of Standards, would consent to approve a meter of the ordinary form which was lagged in such a way that it did not read correctly kilowatt-hours, but did run at an increased speed as power factor went down, we could without the application of any new meter principle, and without promoting too much patent litigation, obtain from at least three makers a meter looking exactly like our present meters and having no new elements, which meter would penalize or correct the charges for service proportionately as the power factor fell off and in any degree that was desired. You know how it is with any of the ordinary meters —they can be made to speed either proportionately to or inversely as to power factor or some function of the power factor. The metering device, therefore, is ready at hand and it seems only to need, as a preliminary to its use, the approval of some forty-eight separate State authorities, a few bureaus at Washington, and a trade name. (Applause.)

THE PRESIDENT: We will now take up the next and last item on the program, "The Electric Truck in Modern Transportation," by Mr. E. E. LaSchum, general superintendent of Motor Vehicle Equipment of the American Railway Express Company.

I might say that Mr. LaSchum might be introduced as the operator of the largest fleet of motor vehicles in the world, and I regret that owing to his recent illness he will not be able to present the paper himself. He will be here on the platform, and Mr. Marshall, secretary of the Electric Vehicle Section, will present the paper, and Mr. LaSchum will sum up the discussion. (Applause.)

THE ELECTRIC TRUCK IN MODERN TRANSPORTATION

By E. E. La Schum

In introducing the subject of this paper it is pertinent to observe that the American Railway Express Company, made up of the several national express companies, is the largest organization of its kind in the world. The business of this company is *transportation,* not as an *incidental* phase of its business, ***but as its sole function.*** Obviously, each and every phase of transportation must necessarily be subjected to minute scrutiny, component elements co-ordinated and systematized, and the most efficient, economic and dependable transportation equipment selected for the various classes of work involved—and operated with great care. Transportation, with an express organization, must be reduced to a science. Hit or miss, or the sentimental selection of equipment, and its slip-shod operation, can have no part in an express company's transportation program—that is, if its business is to be successful.

It too often happens that the merchant or professional man is so busy in his particular line of effort that he overlooks many important factors connected with big business which are necessary for successful management. One of the important factors connected with most business institutions is the haulage or trucking proposition, and if we could bring to light some of the underlying principles of motor trucking, if we could have them thoroughly understood and recognized, we would do much to solve one of the important factors with which the general manager is confronted daily.

The most important of all motor trucking questions to my mind is the selection of proper motor vehicle equipment. Under no circumstances should this important duty be assigned to the unskilled; in fact every trucking proposition of importance should be carefully analyzed by unbiased, qualified engineers and their specifications should be the rule and guide. In other words, a

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firm contemplating the purchase of motor vehicle equipment should not merely think in motor vehicle terms when buying or being sold motor vehicle equipment, but it should have an all-embracing analysis made of its trucking requirements by competent transportation engineers, thereby giving consideration to all factors necessary to the selection of proper equipment.

After the equipment has been intelligently and properly selected, careful attention must be paid to its proper operation, especially with regard to routes, drivers, helpers and loading and unloading facilities, and maintenance should be carried on according to the best engineering practices. Of equal importance should be considered the question of accurate records of operation and maintenance; these records should include every item of expense, and they should be frequently analyzed in order that the department head may know exactly what the trucking proposition is costing and in order that he may, by such analysis, bring about even greater efficiency.

Following the idea outlined above, the express companies, now merged into one—The American Railway Express Company— commenced buying motor vehicle equipment in 1907. We are now operating one thousand fifty-eight (1058) electric trucks in twenty-three (23) cities—an average of forty-three (43) per city. From our experience and observation we are firmly convinced that, in its particular field, the "electric" is the most economical, reliable and efficient vehicle in operation to-day. This is especially true where the truck is operated in service where the hauls are short, stops frequent and freight abundant, because they are easy to control, they are extremely simple, their action is positive while in motion, and they require absolutely nothing while standing. The fact that the driver in the express company's service is an expressman and not a chauffeur shows conclusively that the "electric" has many advantages, and these advantages always appeal to the operator. Relative to the question of economy, efficiency and dependability of the "electric," I submit the attached recapitulation of six months' cost of operation and maintenance of a fleet operating in an extreme eastern city, a north-central city and a south-central city. In each case they have been operated for a number of years, during a time when cost of operation has been highest. If these reports are used as a basis for making comparisons there should be no doubt of the ability of the "electric" to fill the bill.

"Electrics" are not affected by extreme weather conditions—cold, hot, wet or dry—and we have found them to be entirely capable of manipulating the heavy grades found in such cities as Kansas City, Mo., St. Louis, Minneapolis, Denver, and other places equally hilly. They are used by the American Railway Express Company generally in congested districts, but we have no hesitancy in placing the larger capacities such as the 3½ and 5-ton on what we know as transfer service, where the run is continuous from one point to another and where the loads are heavy, distances making no difference as long as the day's mileage does not exceed 40 miles, which we have found to be about the capacity of batteries properly selected.

Batteries should be selected with the same care by a capable engineer in order that trucks may not be equipped with batteries of too little capacity, and at the same time in order that they may not carry excess weight by being equipped with over-capacity batteries.

After batteries have been selected careful attention should be given to the installation of charging apparatus, and we have always found battery manufacturers willing to lend every assistance in installations of this kind. We have particularly noticed that the electric light and power companies' contract and engineering departments have been very willing to co-operate with us, and in some cases have actually looked after the installations from the engineer's standpoint. In my dealings with these departments I have always found them keenly interested in the electric truck proposition and glad to see the electric truck making progress. We are pleased to say, also, that we have no complaint to make regarding rates, especially where it has been possible for us to contract for current on the off-peak schedule, and I believe I can say, without violating any confidence, that where we have a number of electric trucks in one fleet and purchase current direct from the central station, the rate is never higher than 2.3 c. per kw-hr., and in some cities it ranges as low as 1½ c. per kw-hr. We can say, further, that where we obtain service from a local garage we find that the rate charged for current, which is generally on a continuous service basis, is consistent and reasonable, and I know of no case where we have been seriously bothered by interrupted service. Taking into consideration the abnormal period all industries have passed through recently, the fact that the central stations gave us continuous service seems to indicate highly efficient management, and we, the largest users of electric trucks in the world, are truly grateful to them.

Another thing that may be said in favor of the "electric" is that, considered from the standpoint of safety, it is superior to any other type of vehicle. Our records show that the "electrics" are entirely free from excessive speeding, which is exceedingly dangerous to life and destructive to property, and with the greatly increased use of trucks our roads are showing the destructiveness of high speed, heavy motor trucks, due almost entirely to the selfishness of the operator whose "get there at any cost" attitude places the superior, economic advantages of the modern motor truck in a false position. The advantage of the "electric" is that, with the possible exception of coasting down grades, it cannot be driven at an excessive rate of speed. Head-on collisions are the exception rather than the rule, and in reviewing our accident reports we find the "electric" rarely implicated. This, we believe, is due to its simplicity and ease of control, and especially to its continuous and even rate of speed, there being no chance for the operator to perform in a spectacular manner and therefore no sudden bursts of speed which are very likely to result in trouble. The continuous torque of the electric motor, or the cushioned application of power, makes skidding with the "electric" practically an unheard of thing, and the fact that the "electric" can be operated with the minimum demand on the mental and physical abilities of the driver makes it most advantageous from the standpoint of safety.

Another advantage in favor of the "electric" is that it is practically free from fire hazard. While we have had electric trucks on fire and some of them seriously damaged by fire, we know that these fires were due to the failure of the human element and not chargeable to the truck itself. Since the human element to a certain extent is beyond our control, we believe the "electric" is the safest type of vehicle from the standpoint of fire hazard, all of which, of course, enables us to insure them at a much lower rate than other types of vehicles.

We have found the "electric" capable of standing up in the service for a period covering some eleven years, as we still have in operation some which were purchased in 1907. As a matter of fact, the "electrics" being manufactured today should, I believe, be operated economically for as long as twenty years. There are comparatively few wearing parts, and since they are generally rotating instead of reciprocating parts, and since lubrication of all wearing parts is positive by the simple method of replacing a few of the worn parts, I see nothing to hinder continuous operation for a very long period. While these "electrics" are being operated for a very long period the user does not have to invest heavily in parts or repair material, and the operator will find that in a shop properly organized the "electric" can be overhauled when necessary in a very short time. The American Railway Express Company frequently overhauls and paints an electric truck in six working days, thus materially reducing the days out of service, and taking this into consideration and the "electric's" freedom from accident troubles, we have found it possible to operate them easily 280 out of a possible 300 working days.

The fact that electric trucks have proven so satisfactory in the service of the express company, brewers, department stores and to many other concerns which have used them extensively, should be conclusive proof of their dependability, but they seem to be surrounded by an air of mystery which, I believe, could easily be removed by co-operation on the part of the electric truck manufacturer, the battery manufacturer and the central stations, by the simple method of furnishing detailed information through advertising or, perhaps better still, by providing field engineers who could devote their time to the intelligent analysis of trucking propositions. I believe that all concerns having a trucking proposition to solve would be glad to have a transportation engineer undertake an analysis of their trucking propositions and would use the "electric" to a very great extent as soon as they were shown its advantages. In this I believe the truck manufacturer and the battery manufacturer should take the initiative because they have the products of their factories to dispose of. On the other hand, when the truck manufacturer and battery manufacturer accomplishes a sale, that sale must be looked upon

1918	Days in Service	Total Mileage	Electricity	Battery Repairs	Tire Repairs and Renewals	Painting	Body Repairs	Chassis Repairs	Garage Expenses	Total Expenses
BOSTON										
July	23	438	$9.70	.....	$5.88	$ .74	$4.64	$33.67	$37.50	$92.13
August	23	429	10.43	.....	7.16	.57	4.72	43.64	36.06	102.58
September	23	725	9.49	.....	1.79	.56	4.93	30.00	35.30	73.07
October	23	441	9.56	.....	10.21	.77	6.35	25.45	34.36	99.70
November	23	449	8.37	.....	7.33	.58	4.46	28.47	36.38	77.59
December	23	460	9.48	.....	11.64	.67	5.79	37.17	42.01	110.76
Average cost 6 months	138	2942	$57.03	.....	$44.01	$3.89	$30.89	$198.40	$221.61	$555.83
Average cost per month	23	490	$9.50	.....	$7.34	$ .65	$5.15	$33.07	$36.93	$92.64
CLEVELAND										
July	23	487	$10.11	$11.02	$6.24	....	$ .96	$29.23	$11.46	$69.02
August	24	500	11.67	19.61	3.69	....	.34	22.11	13.42	70.84
September	22	486	10.12	10.98	1.09	.58	.23	18.02	17.31	58.33
October	23	495	9.51	17.63	4.37	1.65	6.48	21.54	18.06	79.24
November	21	499	8.90	13.01	6.67	3.35	9.91	29.82	16.21	87.87
December	24	503	10.22	2.08	3.95	2.69	10.59	31.60	9.23	70.33
Average cost 6 months	137	2970	$60.53	$74.33	$25.98	$8.27	$28.51	$152.32	$85.69	$435.63
Average cost per month	23	495	$10.09	$12.39	$4.33	$1.38	$4.75	$25.39	$14.28	$72.61
MEMPHIS										
July	25	633	$24.09	$4.24	$4.08	....	$1.84	$3.24	$18.76	$56.25
August	38	677	26.17	8.16	2.04	....	5.08	2.61	18.76	62.82
September	24	609	24.53	3.44	4.18	$3.13	3.25	2.10	18.76	59.39
October	25	631	26.09	6.32	14.80	2.50	8.98	10.32	18.76	87.77
November	22	550	21.40	19.60	9.94	....	9.08	2.68	17.50	80.20
December	22	543	20.93	5.32	....	2.22	11.82	2.31	16.81	59.41
Average cost 6 months	156	3643	$143.21	$47.08	$35.04	$7.85	$40.05	$23.26	$109.35	$405.84
Average cost per month	26	607	23.87	$7.85	$5.84	$1.31	$6.67	$3.88	$18.22	$67.64

as a single sale as they may not sell another; whereas the installation of an electric truck creates a continuous demand for electricity sold by the central station, and inasmuch as a truck battery is usually charged during the night, or the off-peak period, it seems to me that the central station should be interested in getting more and more of this kind of business, which must act as a balance wheel, or to straighten out its load curve.

Looking at the proposition from every angle, all three should be keenly and probably equally interested in electric truck sales.

The foregoing compilation is a recapitulation of average cost of operation of a single electric vehicle, taken from the reports received by the American Railway Express Company from three cities, representing the eastern, central and southern parts of the country. These averages are obtained by dividing the number of trucks operated in the fleet into the total number of days in service, total mileage, electricity cost, battery repairs, tire repairs and renewals, etc., covering a period of six months, from July 1, 1918, to December 31, 1918, for each city; also the total aggregate cost of operation of one "electric" for the entire six months and the average cost per month of operating one vehicle based on the figures for the six months, for which see foregoing table.

THE PRESIDENT: This paper is now open for discussion. I understand that one or two of the past-presidents of the Electric Vehicle Association are to say a word. We will first hear from Mr. Blood.

W. H. BLOOD, JR., Boston: Mr. Chairman, I am glad of the opportunity to say a word in appreciation of Mr. La Schum's admirable paper. It is very gratifying that a paper such as this should come from a gentleman occupying a neutral position such as he does. He has no "axe to grind," no trucks to merchandise, no batteries to sell, and no electric current to dispose of.

On page 38 he sums up the whole thing in one sentence: "From our experience and observation we are firmly convinced that, in its particular field, the 'electric' is the most economical reliable and efficient vehicle in operation today." That is a very strong and a most satisfactory statement. I want to emphasize, however, one clause in his statement, *"in its particular field."* The trouble we had in the early days was in trying to make the electric vehicle do what a gas car does. It won't do it; we asked too much of it. A sniper does not use a 9-inch gun to pick off an individual man. The electric has its proper field and Mr. LaSchum has told us what that field is.

Then on page 39 he states just what the original Electric Vehicle Association of America stood for and tried to accomplish. He remarks, "We have particularly noticed that the electric light and power companies have been very willing to cooperate with us and in some cases have actually looked after the installations from the engineer's standpoint. In my dealings I have always found them keenly interested in the electric truck proposition, and glad to see the electric truck making progress." He also expressed appreciation for the cooperation of the manufacturer, and proved conclusively by his enlightening figures that the electric truck can be profitably used for handling the express deliveries of our large cities.

I again express my appreciation of this admirable paper.

FRANK W. SMITH, New York: When Mr. Blood has discussed an electric vehicle paper, about everything that may be said on the subject has been said. I heartily agree with him that those of us who have been identified with the electric vehicle for so many years find the atmosphere created by the presentation of Mr. LaSchum's paper most agreeable.

Government ownership or operation of public utilities has done many things (I was about to say many weird things), but if it has done nothing more than make possible the presentation of this paper, giving, as it does so completely, the operating costs of an electric vehicle fleet of more than 1000 trucks widely scattered over the country, we can be grateful.

I am able to check very closely the figures given by the author, and find them to be generally in accord with the operations of the electric vehicle fleet of our company in New York City, which numbers about the same as the average number of vehicles operated in the different cities by the Express Company. For instance, if we analyze briefly the figures given in the table on page 42, we find that in column 2 the total mileage given for

Boston almost corresponds with our mileage on the 2000-pound wagon doing practically a similar service.

In column 3, where Mr. LaSchum gives the cost of electricity as $9.50 for Boston, our cost is $10, and I might say that it is our practice in charging the cost of current into the operation of the electric vehicle to apply the standard battery rate to the ordinary customer for that class of service. As to the tire repairs, in column 5, which are given as $7.34 and $4.33 for the cities of Boston and Cleveland, respectively, our costs are somewhat lower, due, I believe, to the fact that our service is perhaps not so severe. In other words, analyzing each of these several figures (and I might go through the entire table with this result), we check very closely with the results obtained here.

I think the thanks of this Association are due to Mr. LaSchum for his carefully prepared paper. I hope some day that this same author will find it agreeable and possible to present a similar paper covering the operations of his gasoline fleet, which, I think, would show some interesting comparisons to the benefit of the electric vehicle.

A. B. COLE, East Pittsburgh: Possibly there is one point in connection with the operation of electric trucks you gentlemen have not thought of or considered. The electric railways are confronted with a great problem as to whether they should haul freight or not, and a good many of them that are hauling freight are also confronted with the problem of collecting and delivering freight. The system which the electric railways have adopted for picking up and delivering freight, to be transported upon the electric railways, has been found to be a failure, and it is principally due to the fact that it depends on horse-drawn vehicles and gasoline cars.

We find there is a definite field for the electric truck, as in most of the pick-up and delivery service in cities where the electric railway is in operation, the haul is of such a short distance that the electric truck really is economical.

The gasoline truck operators, as a whole, are confronted with the problem of the distribution of food. Last week I attended a meeting of the National Highway Traffic Association, and one of the problems which interested all the men who are connected with the operation of motor truck lines between cities was the distribution of food. They emphasized the fact that as yet there were not enough gasoline trucks operating in fleets to make much difference in the way of distributing food to the metropolitan districts.

Now, with the electric truck operators and also the central stations, of course, cooperating with the electric railways in the handling of freight, it seems quite possible, with a proper coordination of these facilities, for the electric railway to haul food to the cities, the electric railway trains to be met by fleets of electric trucks, which can distribute the food. Possibly later on we could look to what we might call a unit container system —this may be a dream—but it may be possible to haul the body of the truck to various points in the country and then transfer the body to an electric railway car, the body to be transported on the electric railway; and when the train reaches the city or metropolitan district this body in turn to be transferred to an electric chassis; and the further transportation be made in that way. You can easily see how the economic distribution of food and reduction in its cost can be accomplished.

JOHN F. GILCHRIST, Chicago: As one who in the past has been much interested in the subject, I want to add my testimony and assure Mr. LaSchum of the appreciation of the men in this industry of his act in coming here and presenting this paper and giving these figures before the Association. I am sure that it will do more than anything that has yet been done to assist in placing electric trucks where they belong and enabling this industry to get the business of selling electricity to charge the trucks.

FRANK C. REILLY, New York: During the discussion there occurred to me one phase of the electric vehicle situation, seriously affecting the future of trucks of this type, and that is the matter of garage facilities, the lack of which is a serious embarrassment in the merchandising of electric trucks.

In New York City and elsewhere, but unfortunately in only a few cities, some of the battery manufacturers have inaugurated maintenance systems and established garages in which electric trucks are stored and properly cared for at rates that are extremely economical and which will by comparison, if the zone of operation is within the mileage range of the modern "electric," make the competition of the gas truck of small consequence where the prospective buyer makes an intelligent analysis of operation, giving consideration to comparative useful life, accidents, interruptions of operation for repairs, tires and electricity, as against gasoline and lubricating oil.

When you can place a five- or six-ton electric truck in a public garage, as you can in New York City, and have it cared for, washed, charged and maintained "ready for your driver to hop on," at a cost of from $70 to $80 per month—less than the cost for gasoline and oil for many gas trucks being operated in service where the monthly tonnage delivered is no greater, and frequently less, than "electrics" of equal loading capacity—it seems to me that the sales problem of the electric vehicle and storage battery manufacturers will cease to give us any great anxiety. The new commercial electric garages being opened in New York each year exert a very definite influence in the matter of facilitating sales.

It is an extremely simple matter to sell a prospect an electric truck, where the field of operation requires a daily travel of from forty to sixty miles, when you can assure him that there is an electric truck garage, conveniently located, that will house the truck and wash it, and charge and maintain the battery for a definite and reasonable monthly charge.

You can further assure the prospect that the garage will give his battery expert attention, prolonging the life of the plates and eliminating to a great degree the terrific maintenance costs of gas trucks.

In territories where there are no proper facilities for caring for electric trucks, it is correspondingly difficult to effect the sale of an "electric," as the prospect is alarmed at the idea of taking care of the battery—frequently having an idea that a vehicle battery requires the constant attention of a physician and a trained nurse.

Where there are modern garage facilities, as maintained in some cities by the storage battery manufacturers and the electric lighting companies, and the owner can unload the responsibility for the proper care of the battery on a trained organization, his fears are quickly dispelled, and as the fleet grows and the owner becomes familiar with the operating economy and comparative simplicity of the "electric," it is frequently decided to provide private garage facilities.

There are a number of valuable points made by Mr. LaSchum in his paper that are deserving of special consideration, particularly the reference to the really long life of the electric truck. It is not infrequent that gas trucks employed in the delivery of shipments to the piers of the great steamship lines at New York are required to wait in line for two or three hours for their turn to unload, with engines running continuously because of the necessity of being all set to move up whenever the trucks ahead move. Engines running idle in this manner are wearing the chassis out faster than when traveling normally, the vibration literally shaking the truck apart. It is in this class of service, more than any other, that the economy of the "electric" is demonstrated. The electric truck driver is not obliged to keep his motor turning over or the battery discharging, yet is at all times ready to move up with the procession.

Trucks that I know of in Washington have been in use there since 1904 and will probably give several years more of valuable service. They are used by one of the express companies, and I rode on one recently with a driver who stated that he had been operating that particular vehicle for eleven years. It had outworn several batteries, but, except for minor replacements, was still the same old chassis.

It is in the introduction of the electric truck, to concerns unacquainted with its operation, that the need for cooperation between the vehicle manufacturer, the central station and the battery manufacturer is most necessary. After the first truck has been in use long enough to have demonstrated its economy and dependability there is no hesitation in adding other "electrics."

I believe that, in years past, the electric truck manufacturer depended upon the central station to sell his product for him. He considered that all he had to do was to construct the truck and that the lighting companies should stand ready to take it off his hands and care for it forever after. If the gasoline truck manufacturers had depended upon John D. Rockefeller to sell their trucks for them, it is doubtful if their sales would have attained anything like the present volume. The electric truck manufacturer must do his own selling—but in all his efforts he must have the cooperation of the battery manufacturer and the central station.

THE PRESIDENT: If there is no further discussion we would be glad to give Mr. LaSchum an opportunity to close the discussion.

MR. LASCHUM: I simply want to express my appreciation and thanks for the opportunity offered me to get this thing out of my system. I have been preaching on the highways and byways for years this sermon of the electric truck, and I want again to thank the members of this Association for their kind words of appreciation. I am sorry since my battle with old man pneumonia that I can hardly talk, but I will thank you again and sit down.

THE PRESIDENT: That is the end of our program this morning, but I would like to ask that all assemble promptly at 2 o'clock, at the various sessions in the various meeting rooms, so that we may proceed punctually with our program.

(The meeting then adjourned.)

SECOND GENERAL AND EXECUTIVE SESSION

THE PUBLIC POLICY SESSION

TUESDAY, MAY 20, 1919

PRESIDENT WELLS called the meeting to order at 8:45 o'clock.

THE PRESIDENT: The first paper of the evening is the Report of the Committee on Sale of Company Securities to Customers and Resident Citizens, W. H. Hodge, Chairman, H. M. Byllesby & Company, Chicago.

I regret that Mr. Hodge is unable to be present tonight, but the paper will be presented by Mr. John G. Learned, a member of the Committee.

REPORT OF COMMITTEE ON THE SALE OF COMPANY SECURITIES TO CUSTOMERS AND RESIDENT CITIZENS

During the past few years a new movement of vital significance to the central station industry has been under way. This movement consists of an effort upon the part of central station companies to distribute their ownership in ever-increasing measure among the citizens whom they serve with electricity. It has become known quite generally as "customer ownership," and has reached a stage where its practicability cannot be questioned. As to the beneficial results from the central station standpoint, only the passage of time will reveal whether the possibilities which seem to be apparent will be realized, and whether the movement can be developed to a breadth where a utility company, at the same time

—will be owned to a considerable extent by a large number of its customers;

—will retain the direction of skilled management;

—will retain the efficiency of private ownership;

—will retain the progressiveness and resourcefulness of private initiative;

—will be free from adverse public opinion.

Your Committee was created in February, 1919, for the purpose of studying the adaptability of commercial representatives for selling company securities direct to the public. It was felt by the Executive Committee of the Commercial Section that the customer ownership movement had grown in popularity to an extent warranting an inquiry as to the relation to it of the Commercial or Sales Departments, and an effort to determine if the trained selling ability already employed by central station companies could be utilized in this new line of endeavor.

Although no time was lost in organizing the Committee personnel from men who have had actual experience in the selling of company securities to the public, the interval at our disposal has

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Manuscript of this report was received April eighteenth.
Read at Public Policy Session.

been too short to permit of the thorough investigation of this whole subject which its importance deserves. We have been compelled to collect such information as member companies were able or willing to supply on short notice, and to prepare a summary of these data.

Involves Far-Reaching Problems

So far as your Committee knows, this is the first report on the subject which has been presented to any national association. We are unable to discuss a single phase of this large question without first devoting some attention to describing the customer ownership plan, the objects sought, the sales results so far obtained and the various methods employed by the central station companies engaged in the innovation.

We wish also to call your attention to the fact that the subject is involved with several of the most stubborn problems of common interest. First it is concerned with that question now convulsing a large portion of the globe—the distribution of property; second, it strikes directly at the heart of the controversy raging over the respective benefits to society of private or corporate ownership and operation of utilities as opposed to public or political operation; third, it bears directly on the problem of obtaining upon the most economical terms the continuously demanded quantities of capital necessary to extend the advantages of electricity to an ever-widening number of people and ever-growing industrial and agricultural activities; and in the fourth place it is intimately associated with the bettering of the common lot by its part in building up habits of saving on the part of the individual and providing him with a safe, marketable and readily available investment.

It is impossible to expect your Committee to make anything approaching a complete exposition of the subject within the confines of this report. Several of the sessions of this convention could be devoted to it and still much would be left unsaid. We realize that the war has seriously interfered with the work of the national associations, and for this reason, doubtless, the subject of the distribution of company securities, or ownership, among the public directly served, has not been reported upon and discussed in our national conferences before.

Considering the incessant attacks which have been made upon all large industrial and business organizations for years, the constant stream of municipal ownership and other socialistic propaganda, the political and economic dislocations caused by the war, and the widespread social unrest, it is proper that movements such as that now under discussion should have keen and exhaustive attention from national organizations devoted to the welfare of great and useful industries engaged in production and service required by the public.

Many Examples of Success

Since 1913 upwards of fifty and possibly one hundred or more, central station companies have sought to interest their customers and other citizens of the communities which they serve in their interest- and dividend-bearing securities. Some of these companies are very large ones, serving under a single organization hundreds of cities and towns of various sizes. Others serve great American cities, and a number are small organizations requiring an inflow of new capital only once or twice in a decade. Forty-eight of these large and small companies during the past few years have marketed locally among a multitude of people—

	$27,134,057	of Preferred Stock
	3,862,500	of Common Stock
	2,294,000	of Bonds
	6,724,600	of Short Term Notes
Total	$40,015,157	of central station securities.

From an estimate, based upon incomplete figures, these securities were distributed among 36,000 individuals or an average purchase of about $1,100 par value, and it is safe to say that 90 per cent of these investors had never before owned a stock or bond of a public utility company.

The figures just given, as before indicated, are by no means complete. A full showing probably would expand them by 50 per cent.

The first step taken by your Committee was to send out a letter and questionnaire to all member companies in the United States and Canada in order to ascertain as nearly as possible what actually had been accomplished. Two hundred and fifty-six companies replied. Of this number

48 have developed direct selling plans for distributing their securities among their customers and resident citizens.
10 endeavor to distribute their securities among resident citizens through banks and brokers.
18 of the 48 first-mentioned companies, in addition to selling their securities direct to the public, also utilize banks and local firms dealing in securities.
208 companies replying have done nothing along these lines.
45 of the companies which have not yet initiated customer ownership work are deeply interested therein and contemplate action.

Among the member companies that failed to reply are a number known to have engaged in the local distribution of their securities with success. Several of these companies are large organizations, and it is regretted that the data derived from their experiences are not available for the purpose of this report. These companies simply did not return the questionnaires, and no additional effort was made to induce them to respond.

Practically all of the companies that have started the distribution of securities among customers and resident citizens are enthusiastic regarding the results already accomplished. Only two companies reported discouraging experiences, both small organizations, one on the Pacific Coast, the other not far from the Atlantic seaboard. One had tried to sell its stock direct to the public by means of a special salesman, but "the public displayed so little interest in the proposition that the salesman was taken off." The other company "endeavored to float its first securities through the local banks. It was a dismal failure and cost considerable money."

Among the companies reporting successful efforts in the local distribution of securities are the following:

Companies Practicing Customer Ownership

Arkansas Valley Railway Light & Power Company	Pueblo, Colo.
Cedar Valley Electric Company	Charles City, Ia.
Central Illinois Light Company	Peoria, Ill.

Central Maine Power Company	Augusta, Me.
Charlottesville & Albemarle Railway Company	Charlottesville, Va.
Chester Valley Electric Company	Coatesville, Pa.
Coast Power Company	Tillamook, Ore.
Connecticut Power Company	New London, Conn.
Consumers Power Company	Jackson, Mich.
Dayton Power & Light Company	Dayton, Ohio
Denver Gas & Electric Company	Denver, Colo.
Dixie Power Company	St. George, Utah
Edison Electric Illuminating Company	Brockton, Mass.
Electric Bond and Share Company	(Eight Companies, variously Located)
Iowa Gas & Electric Company	Washington, Ia.
Iowa Railway & Light Company	Cedar Rapids, Ia.
Jefferson Electric Company	Jefferson, Ia.
Lincoln Traction Company	Lincoln, Nebr.
Mahoning & Shenango Railway & Light Company	Youngstown, Ohio
Mansfield Public Service & Utility Company	Mansfield, Ohio
Michigan Light Company	Jackson, Mich.
Minnesota Utilities Company	Chisholm, Minn.
Northern Iowa Gas & Electric Company	Humboldt, Iowa
Northern Ohio Traction & Light Company	Akron, Ohio
Northern States Power Company	Minneapolis, Minn.
Northwestern Electric Service Company	Meadville, Pa.
Ohio Service Company	Coshocton, Ohio
Oklahoma Gas & Electric Company	Oklahoma City, Okla.
Otter Tail Power Company	Fergus Falls, Minn.
Ottumwa Railway and Light Company	Ottumwa, Iowa
Pacific Gas & Electric Company	San Francisco, Cal.
Public Utilities Company	Evansville, Ind.
Rochester Railway & Light Company	Rochester, N. Y.
San Diego Consolidated Gas & Electric Company	San Diego, Calif.
Southern California Edison Company	Los Angeles, Calif.
Southern Illinois Light & Power Company	St. Louis, Mo.

Springfield Light, Heat & Power Company	Springfield, Ohio.
State-Centre Electric Company	Clearfield, Pa.
Toledo Railways & Light Company	Toledo, Ohio
Union Electric Light & Power Company	St. Louis, Mo.
Western Illinois Utilities Company	Illinois
Western States Gas & Electric Company	Stockton, Calif.
Wisconsin Edison Company (Including Milwaukee Electric Railway & Light Company)	Milwaukee, Wis.

Occupies a Middle Ground

Customer ownership, or the sale of utility company securities direct to the public, is a definite and tangible act towards better relations between service companies and the public. This movement tends to destroy the exclusive and privileged atmosphere which has heretofore surrounded the majority of service companies. It seeks unmistakably to unify the interests of these organizations and the people, not in platitudinous fancy, but in sober fact. It represents a willingness on the part of the companies to take the people into partnership and to share whatever profits there may be. With the aid of the partial-payment plan, it gives every worker who can save a dollar an opportunity to become a part owner of the property and to receive a good but not excessive return upon his investment, at the same time providing him a safe investment in an enterprise which is serving and helping to build up his own community, and which he can have at all times under his personal observation.

Customer ownership occupies the middle ground between private ownership and operation as we have known it in the past, and public ownership and operation—that is, by the municipality or the state. It represents an effort to combine generally beneficial features of each and to broaden and extend these benefits rather than to contract them. Holding fast to the principle of individual property ownership as opposed to communism, it seeks to have many people in a given community own in their individual right fractional parts of their utility companies, thereby sharing in the profits, if profits accrue. At the same time it seeks to preserve the initiative, the resourcefulness, the economy and the efficiency of private enterprise. It represents one of those economic compromises which seem to be necessary from time to time in the progress of civilization, which at first inspection seem revolutionary, but which soon become the accepted order.

Irrespective of the comparative merits of public and private ownership, as we have understood these distinctions, we must recognize the fact that a great pressure exists, having as its object the municipalization of the utility organizations; that this pressure has been exerted for many years, and in a considerable number of places has resulted in complete and actual experiments. During the war period this pressure has greatly increased. We cannot be blind to these conditions. We owe it to our industries, to ourselves and to our Americanism to find a solution along what we conceive to be the lines of constructive right.

Your Committee has not made an attempt to secure an estimate of the generally beneficial results to utility companies from the distribution of their securities at home, feeling that the time is not yet opportune for such an inquiry. Many expressions of a general nature came to its attention, bearing out the opinion that the leading objects sought are being realized.

Aims at Ownership by the Many

The original notion of the ownership of a corporation through shares of stock was that of exclusiveness. The fewer shareholders in a successful company, the better for the man who already had an interest in the undertaking. The fewer there were to apportion the profits among, the greater would be the individual gains. From this came the practice, lasting down to our own time and in our own laws, of first offering any new issue of stock to the existing shareholders, before placing such shares on the market. The capital stock of many great American companies—industrial and utility—has been successfully marketed in this way as the business grew, and, in some notable instances at least, it has not prevented the broad distribution of the stock among many thousands of people, through the sale of stockholders' rights, the transfer and breaking up of individual holdings, etc. Aside from the exclusive nature of offering additional stock issues first to shareholders, another principle is involved, that of equity, it being universally recognized that the proportional holdings of an ordinary stockholder in a company must not be changed without giving him an opportunity to maintain his proportion of the total capitalization by additional purchase. This requirement of stock issues, however, would seem to apply to the ordinary, or common stock, rather than to the preferred stock, which is a class of security based upon the regularity of return to the investor at an agreed rate.

The customer ownership idea, of course, is exactly opposite to the early idea of stock ownership by the few. It aims at stock ownership by the many—the largest possible number—with the retention of direction and immediate control by those responsible for the maintenance and operation of the industry. The questions of control and the financial returns to those who carry on the enterprise, and to those who are willing to assume a greater proportion of the risk of depleted earnings than the man of small means can afford, while deserving careful attention, are not obstacles to the successful working out of the general plan. Like many other difficulties they are not nearly so formidable when actually met as they may appear in advance.

If the management of a utility company is competent and tactful, exercising a proper conception of the rights of its customers, shareholders and public, there is little fear that its body of customer shareholders will desire it dispossessed. As to the financial returns to those who bear the major risk, the general rule of what is reasonable and fair is the only one that can govern. These are questions which have not been raised in criticism of the plan up to this time, but they are natural and obvious inquiries suggesting themselves at once to the casual investigator, and it will be necessary that they be met and dealt with in the future.

Limitation of Earnings and Form of Capitalization

Two outstanding facts have had a tendency to facilitate the broad distribution of central station securities among residents First, the limitation of earnings by public opinion, by law and by regulation, due to the naturally monopolistic and public character of the industry; and second, the modern form of capitalization of utility companies. As to the first, it is unnecessary to go into detail. Utility companies are now limited to earnings of from 6 to 10 per cent upon the value of their investment, the rate varying in different localities, and to some extent affected by variations in the purchasing value of the dollar. This—in combination with the policy of regulation—means a stabilization of the business, and a reduction of the speculative possibilities to a narrow compass.

The modern form of utility capitalization is devised to secure the inflow of the necessary capital upon the cheapest terms. It consists, therefore, of

Mortgage Bonds
Coupon Notes
Preferred Stock
Common Stock

and it is necessary to preserve the correct balance and proportion among these classifications in order to maintain results of the first order.

The long term mortgage bonds represent that part of the capital amply protected by physical property upon which interest rates are paid to the investor. The coupon notes represent short-term financing, of a more or less emergency or temporary nature, to be retired upon favorable opportunity by bonds bearing a lower interest rate. In order to make the bonds and notes attractive to the investor, there must be preserved a proper proportion of equity or stock ownership. Usually the proceeds of bonds can be utilized for not to exceed 80 per cent of the total cost of construction, and since the bonds are issued for this purpose, it is necessary to find the capital for the remaining 20 or more per cent of construction costs from other sources. Frequently this "other source" is found in preferred stock, upon which a definite rate of return is paid in dividends, but which has neither mortgage rights nor any possibility of a rate of return higher than that prescribed. Into the common stock, therefore, usually are crowded what speculative possibilities may exist and the working control or direction of the company.

It is clear that, taking a company limited to 7 per cent net earnings upon the investment, it can, by paying say 5 per cent to 6 per cent upon that large part of its capital represented by bonds, pay 7 per cent upon that smaller part of its capital represented by preferred stock and, in good years, pay 8 per cent or even more upon the still smaller proportion of its capital represented by common stock—at the same time keeping the profits within the limitation.

Under these circumstances we find a kind of equity security, namely the preferred stock, which is in most cases practically exempt from the hazards of the business and of the effect of fluctuations in net earnings—a security that represents both actual ownership in the enterprise and a reasonably sure prospect of sustained annual returns better than the normal interest rate. The stock also is protected in the respect that if dividends are skipped they must all be paid before the common stock can make a return, and in case of dissolution or sale the preferred shareholders would participate in the distribution of assets immediately following the bond and note holders and prior to the common shareholders.

The limitation of earnings of utilities and the fixed dividend rate on preferred stock, unquestionably reduce the value of existing shareholders' rights to purchase newly issued preferred stock. This particular form of security is bought, not in expectation of a high rate of return or of great enhancement of market value, but as a solid investment, yielding reasonably certain dividends every quarter. This is the general rule to which there are, of course, exceptions. In view of the character of the investment it is a question whether the preferred shareholders are reasonably entitled to priority of purchase of new issues, or any advantage as to price over the general public. As a preferred class of investors they are practically in the relation of debenture holders to the company issuing them, as well as being shareholders. The shareholders' rights meriting real consideration in this sense are those of the common shareholders, as every security placed ahead of theirs to some extent changes the position of the common stock.

This disquisition, tiresome as it may seem, is essential to anything approaching a study of the subject. Just as customer-ownership seeks to bridge the chasm between public ownership and private operation, the preferred stock serves as the middle ground between a security with the lowest yield and the highest safety of principal on the one hand, and the common stock with a maximum of hazard, irregularity of return and the greatest speculative possibilities (so far as anything approaching speculative possibilities can be said to exist still in the electric light and power business) on the other hand.

Preferred Stock Best Suited for Purpose

Therefore, the utility companies that have sought the financial interest of their customers wherever possible have selected their preferred stock as the security best suited to the requirements. There are many other reasons why preferred stock, usually with a 7 per cent dividend yield, is most desirable in the majority of cities and states. The return to the investor will generally compete with other kinds of local investments; that is, it will exceed the net return on first class mortgages and equal or exceed other stocks or participations of equivalent rank. This stock provides an equity investment, and the investor becomes in fact a part owner, sometimes with full voting rights and sometimes not. The dividends are expected to be paid regularly and fully, and the wage earner and the man of small means are not asked to take more than a remote chance of sacrificing principal or yield.

Not all companies are capitalized in the manner described. Some have but one form of capital stock; with others the common stock represents a seasoned and conservative investment, and in some cases the preferred stock has not met its obligations and does not come up to the requirements.

The very nature of the utility business prevents the extension of the customer ownership idea by the sale of stock on a speculative basis. This cannot be done without sowing the seeds of endless discord and confusion. It is necessary to offer the public a sound security, meriting confidence and resting on its stability and the power to pay a regular return somewhat above the current interest yield. The very essence of the plan lies in interesting the people—that is to say, men and women in all walks of life, with all sizes of incomes and degrees of wealth. Failure to pay dividends to a laboring man who has placed his savings in the company would be a very serious thing to him, and would result in a general loss of confidence in the investment which many years of effort could not overcome. No central station company can afford to offer its customers a security in which it has not the utmost confidence as to the regular payment of the agreed return.

The real object of customer ownership is not to sell stock, but to obtain many stockholders. Stock can be disposed of much more readily by working upon a carefully selected list of investors than by trying to secure a given number of very small shareholders from among people not of the investment and often not of the saving class. Selling stock of a well-established utility company is, except in unusual times, simply a familiar business of energy and salesmanship. Creating a large shareholder list from among the people was a new and unchartered undertaking, calling for the development of new angles of endeavor, new methods, new propaganda and a recasting of the relations between the public and the companies.

The salesman of an investment banking house who completes a $25,000 transaction with a single customer considers a good day's work done. The customer ownership salesman does his best day's work when he sells two or three shares of stock to ten or so individuals—and he has had to rise early, travel many miles and make several evening calls if he accomplishes so difficult a feat. A whole month of such effort will usually not produce half the results in the sale of stock as the thirty minutes required by the salesman who approached the large investor. Yet measured in the true interests of the company the laboriously acquired shareholders may be worth many times the large shareholder.

Financing a Primary Problem

Financing extensions and additions always has been a primary problem with utility companies. It costs great amounts of money to build them, reconstruct them and keep them abreast of the growth of the territories which they serve. New capital is demanded year by year in enormous sums. Several years ago Mr. Frank A. Vanderlip estimated the new capital annually required by the utilities at $400,000,000. The large investment banking houses of the country have performed this work in the past, and the growth of customer ownership will not relieve them of the major part of it in the future. Customer ownership will serve as a means of equity financing very well, but it cannot, except in comparatively few places, do the major financing—that is the distribution of bonds and notes. Part of the capital may be obtained at home, but not all of it. Great amounts of money must continue to be raised in the future as in the past, by the investment banking houses which possess the confidence of large numbers of substantial investors and the selling mechanism necessary to secure a wide distribution. But the building up of shareholders' lists at home will add to the stability of the company, will confer upon it the insurance of the friendly interest of numbers of those who hold voting power over it, and is strong evidence to the far away investor that the company whose bond he is asked to buy stands well at home. Briefly, customer ownership will facilitate the work of the investment banking house and will partially relieve the banker of the difficult work of selling stock, as compared with bonds.

Successful Selling During the War

During the war it was impossible for investment banking houses to sell large quantities of the preferred stock of utility companies except at prohibitively low prices. Upwards of half a hundred utility companies did sell their preferred stock direct to the public at good prices during this very period. A vivid object lesson was provided of what can be done along these lines under severe stress. These fifty companies probably sold upwards of $20,000,000 of their preferred stock in their respective communities during the war. The majority discontinued active efforts after the Second Liberty Loan, but a number kept right on because they needed capital for equipment to serve war industries, discontinuing sales work only during the Liberty Loan drives. The companies that kept on were generally successful. Several of the Byllesby companies made high monthly sales records during the heatless Monday period of the winter of 1917-1918. The month before the tide of battle changed in France, 175 preferred stock prospects were induced by a window display to walk from the street into the office of The Minneapolis General Electric Company.

Customer ownership secured the money for these companies when they needed it the most and did it on a cost basis comparable with and better than many of the short time bond and note issues. Even though people were subscribing in an unprecedented way to huge Government loans, numbers of them found it possible to invest in the preferred stock of their utility companies when the stock was offered direct and the construction necessities were explained to them as not inconsistent with patriotism.

Investment Merit Well Established

The general opinion held by the public regarding most public utility companies is that they are financially successful—for the owners. These industries have been well established, have grown rapidly and have expanded their business and property. They occupy large and prominent offices and their service is an everyday incident in the lives of the people. In one way or another they are much in the newspapers and in the public eye. When they are criticized it is usually for making too much money. The majority have reflected the atmosphere of prosperity.

All this is a far cry from the days when a shrewd investor told his secretary to throw Bell out of his office if he came again and sought money to develop the telephone. Most utility companies had to beg for funds with which to get started. Now they have long proved themselves and have become objects of jealousy and suspicion because of their very success. The people take it for granted that an investment in these companies is desirable. If a company in good standing offers its preferred stock as an investment and says that it can and will pay 7 per cent annual dividends, no one disputes these statements or questions the ability of the company to meet the obligation.

Prospects infrequently care to study earnings statements or to analyze the investment. They are interested (1) in the price, (2) the yield, (3) in the marketability of the security if they desire to convert it into cash. Now and then a man comes along who desires to study the company and its condition, but the majority of home investors are merely bored by an array of facts and figures. Companies go along successfully advertising month after month without making the slightest reference to earnings or presenting earnings figures, and hundreds of sales are made without a single reference to this subject. Central stations do not have to parade their ability to pay preferred stock dividends or to prove their prosperity.

SELLING IN THE FACE OF RATE INCREASES

The war not only brought a period of excessive interest rates, but it forced upwards the operating expenses of central station companies to unheard-of levels. In thousands of cities it was necessary to obtain increases in service rates. These increases could not be obtained without a showing of their necessity and a strong presentation of the facts in order to obtain the desired relief.

Now a company cannot sell its preferred stock on the theory that it is losing money. Here arises a situation of apparently hopeless conflict. How would it look to a citizen if he received a letter one month explaining why the company needed higher rates in order to stay in business, and the next month or so received a letter suggesting that he invest in company's 7 per cent preferred stock as a security in all respects desirable for the depositary of his surplus funds? On the first inspection it seems utterly absurd to expect anything except disaster both to rate increase applications and to the sales of preferred stock.

The fact remains that a number of companies did both and succeeded in both. The Northern States Power Company and the San Diego Consolidated Gas & Electric Company, for example, had to increase rates and did so—the first named being for the most part not under state regulation—the latter receiving the approval for rate increases from a State Commission. During 1917 and 1918 the preferred stock sales of these companies in home territory was as follows:

	1917	1918
Northern States Power Company	$945,900	$1,874,800
San Diego Consolidated Gas & Electric Company	318,400	159,100

It will be noted that the Northern States Power Company sold twice as much stock during 1918, the year of heaviest rate increase, as it did in 1917.

In cases such as those just referred to it is necessary to insist that preferred shareholders—at home and elsewhere—are entitled to their 7 per cent dividends, and it is necessary to point out to the prospective investor that the stock during such a period can be purchased at probably the lowest figure it will ever reach. Once the rate increases have become effective, the investor does not have to have the fact that the advance has been accomplished called to his attention. It is possible to find utility operators since the war who are convinced that the only defensive worth while is an attack—an old belief of many commercial representatives.

EFFECT OF LIBERTY BOND CAMPAIGNS

The net result of the Liberty Bond successions has been a nullity to date, but the future effects should be helpful to the local sale of central station securities. The educational effect of the war financing will remain, but while these drives are in progress they prevent many persons investing in utility securities. In the face of the five war loans it has been excedingly difficult to maintain customer ownership methods, and where they were maintained successfully unusual exertion has been demanded.

Several companies conducted highly successful campaigns in 1918, but it can hardly be said that the Government financing was helpful, as the educational value was offset by the demands for cash.

In several cities the educational work in investment securities previously performed by the central station companies was of distinct assistance to the first Liberty Loan campaign. Verification of this statement will be found in the large number of individual subscriptions to the first Loan in Minneapolis compared on a per capita basis with those of other cities, and to the fact that the manager of a securities sales department in Saint Paul was requested to devise the partial-payment plan employed in that city for the first Loan. In these cities customer ownership had been advertised extensively for two years prior to the first Loan and the Company had several thousand home shareholders. Its stock sales fell off slightly the first year of the war, but in 1918 largely increased, as previously referred to, due to unusual sales and advertising efforts. The Loans, however, convinced many utility managers of the possibilities existing among the public for the distribution of sound securities in small lots, and no doubt stimulated some of the utility campaigns in 1917 and 1918. The actual effect of a Liberty Loan drive upon a company continuously engaged in the direct sale of its securities is to reduce sales seriously for a period of about two months.

TWO BROAD METHODS EMPLOYED

A study of the selling methods followed shows that they fall into two broad divisions, which may be described as the

1—Short campaign method
2—Continuous selling method.

Both have been rewarded with successful results. One company, the Central Maine Power, has combined the two. The choice is determined by the circumstances of any given situation and the relative importance of the objects desired. If, for example, the most pressing requirement is the raising of capital quickly, the campaign method is the one selected. On the other hand, if a company wishes to obtain the utmost from an advertising and public relations standpoint, continuous systematic selling brings not only the maximum in public good opinion, but a larger proportion of investors from among the wage-earners. A selling drive, no matter how successful, is forgotten by the public in a short time, while continuous selling means calling the attention of citizens to the broad policies of the company and its democratic character at frequent intervals.

With respect to the cost of advertising and selling, the campaign method usually is the most economical, other conditions being equal. However, it must not be forgotten that the market developed by continuous selling constantly broadens and that a foundation is being laid for very low selling costs in the future. Where, during the first few years of the innovation, expensive sales departments may be employed, eventually it will be possible to dispense with much of the force and expense, and handle a large volume of business by means of advertising, an office man and a stenographer. Such a point has already been reached by one large company—the Pacific Gas and Electric Company—which has kept its selling costs per share very low. The continuous selling method naturally must be stimulated by special efforts of one kind or another, sometimes on the campaign order.

The two divisions of method have a great deal to do with the character of the sales organization necessary to handle the work. As related in this report, a number of successful customer ownership campaigns have been held without the organization of securities departments, the employment of securities salesmen or the devotion of the major time of any one department. By confining the endeavor to a comparatively brief period and by calling upon all executives, departments and employees for intensive cooperation, it has been possible to obtain wonderful results in connection with advertising. In these cases only two or three members of the staff were wholly engaged in the campaign, while a large number of employees devoted some attention to it without interfering with their regular duties. At Los Angeles, Rochester, St. Louis and other places this was the scheme decided upon, and the results speak for themselves, while the low selling costs are also in evidence. In some campaigns no commissions are paid to employees, in others a very small commission has been allowed.

CONTINUOUS SELLING DEMANDS SPECIAL ORGANIZATION

Where the continuous selling method is decided upon, either from the prospective difficulty of the undertaking—the unfamiliarity of the public with security investments, the high local interest rates. etc.—or for public policy reasons, general opinion seems to indicate the feeling that it is necessary to organize special security sales departments, whose personnel derive their bread and butter from one line of effort alone. Where a special department is concentrated upon the job it is necessary to pay adequate salaries or commissions, as the manager and salesmen must make their living from the work and be paid enough to stimulate them to vigorous effort. The work is not of a kind attractive to the average securities salesman capable of holding a place with a reputable investment banking house, because the large orders are few and far between and success consists of a multiplicity of small sales. Neither are the average emoluments tempting to the central station commercial salesman who has achieved a reasonable degree of success. As in every other line, men are developed in customer ownership selling who make much more money than the average, but the earnings ordinarily possible are no more than the average in most sales departments.

The most successful securities sales departments have been recruited from among other departments of the company, including the commercial department. In all cases careful instruction and conscientious study on the part of the salesman has been necessary in order for him to fit himself for the task. The chief requisites are not only a fair degree of selling ability and a fund of cheerful optimism, but a real liking for investment subjects, no fear of hard physical work, and willingness to sacrifice many evenings and holiday hours and above all an absolute faith and confidence in the company.

COMMERCIAL DEPARTMENTS MAY BE USED ADVANTAGEOUSLY

In one or two instances only has local securities sales work been turned over exclusively to the Commercial Department. The amount of securities to be placed in these instances was comparatively small but the departments have performed the undertaking economically and with entire success.

There is no doubt in the opinion of your Committee that any fairly large and well organized Commercial Department could engage in selling securities and do as well as the achievements in selling service and merchandise. This would be accomplished, however, not by loading up the present force with preferred stock or short term notes as a side line, but by creating a sub-department whose staff would be engaged exclusively in selling securities. The Commercial Department manager would man his securities sub-department with employees displaying particular aptitude for the work, and would bring into play all of those cooperative and coordinate activities contributing so largely to any organized effort. Under such a plan the compensation of securities salesmen would be fixed with reference to the actual sales effort and ability required and in harmony with the commercial sales talent of the organization.

Your Committee can see no reasonable objection to the utilization of Commercial Departments in securities sales work, but on the contrary believes that there would be many advantages in such a combination. The sale of securities does not differ fundamentally from the sale of any other service or commodity. The requirements of demand, ability to purchase, and value to the purchaser are found in preferred stock as they are in electric power. A housewiring salesman would not think of trying to sell a 1000 horse power block of energy without being familiar with the power business, nor would the manager of a Commercial Department expect to market a large amount of his company's preferred stock until he thoroughly understood both the security and the broad subject of investment, local and national.

Up to the present the selling activities of central stations have been concentrated in the Commercial Departments with results of undisputed value to the industry. The duties of the Commercial Department have grown and expanded with the development of new uses for electricity. No company would create a special department outside of the Commercial Department to sell electric ranges, even though the company were about to sell electric ranges for the first time. The normal division of labor in central stations is by functional activities, just as it is in the broad scheme of human affairs. That is to say, engineering falls to engineers, construction to people who build, operation to the men who keep the machinery moving, bookkeeping to bookkeepers, and so on, and it is obvious that selling should devolve upon those who have particularly qualified themselves to market the products of the industry.

If the selling of securities is no longer to be the exclusive function of the investment banking houses or the bond departments of utility organizations, which are selling experts per se, we believe that the selling ability already possessed by central station organizations should be called upon. We realize also that in the event that the Commercial Department is called upon for the sale of securities, the duties and responsibilities of the department manager are increased and he should be financially rewarded in proportion thereto. The commercial department manager cannot be expected to enlarge his field and perform the direction of an exceedingly difficult new task in connection with his other duties, without suitable compensation.

ADVANTAGES FROM COMMERCIAL DEPARTMENTS

Aside from the experienced selling direction of the manager, some of the advantages to be gained by consolidating local securities sales with Commercial Departments would be as follows: (1) general familiarity with the field, its business activities, residents, their wealth, etc.; (2) personal acquaintance of manager and salesmen with customers, citizens, newspaper men, leaders of activity, etc.; (3) ability to secure leads and suggestions from men and women employed in commercial sales work who meet large numbers of people and visit all parts of the community served; (4) available supply of salesmen from whom to select candidates for security sales work; (5) the general atmosphere of the department in optimism, constructiveness, push and the determination to accomplish difficult things; (6) the ability to speak from first hand knowledge of the company's business, growth, prospects, etc.; (7) economies in the cost of selling by consolidating the executive duties, advertising, office labor, floor space, etc.; (8) facility of combining stock sales with the cost of financing extensions; (9) ability of promoting commercial lighting and power sales by the sale of securities; (10) flexibility of sales force whereby salesmen in one class of work may be transferred to another in case of slack business, or temporary relinquishment of effort along particular lines; (11) broadening of the opportunities for salesmen and improvement of material for entrance into the department; (12) simplification of organization; (13) coordination in public relations problems and building up good will.

CONCLUSION

In conclusion, therefore, we recommend where practicable the employment of Commercial Departments for the selling of company securities direct to customers and resident citizens.

Respectfully submitted,

W H HODGE, *Chairman*
FRANLIN L HALL
C M HAMILTON
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H SPOEHRER
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C L VAN VALKENBURG
P H WHITING
C E YACOLL

APPENDIX A

REPORT OF COMMITTEE ON THE SALE OF COMPANY SECURITIES TO CUSTOMERS AND RESIDENT CITIZENS

A brief account of home security sales by certain of the member companies reporting to the Committee should be of interest.

PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO, CALIFORNIA

The first organized effort by a very large company to distribute its stock in home territory was made by the Pacific Gas and Electric Company, which serves 178 cities and towns and an immense area in California. The successful outcome of this plan attracted national attention and had a pronounced influence upon a number of other large companies contemplating similar action.

Since July, 1914, the Pacific Gas and Electric Company has built up a home shareholder list in excess of 6000 people, who own $8,359,300 of the Company's 6 per cent first preferred stock. Of this amount $3,785,100 was placed in a year of financial stringency—1915. Advertising and active efforts to push the sale of the stock ceased in April, 1917, on account of the country's entrance into the war. Nevertheless since that date $250,000 of the stock has been sold as the result of the momentum gained in previous years and the advertising power of the regular quarterly dividend checks.

During the time that the Company sold $8,358,300 first preferred stock to residents, an additional $6,396,200 par value of this stock was disposed of to previous shareholders and through eastern investment bankers. It is evident, therefore, that the Company was well able to sell its stock abroad as well as at home and that the home sales did not interfere, to say the least, with the outside market.

The Company established a stock sales department in July, 1914, at the inception of the stock selling campaign. The department consisted of the manager and one stenographer and is under the general supervision and direction of the second vice-president and treasurer. At the beginning of the campaign the services of several members of the Commercial Department, who were ordinarily engaged in soliciting electric and gas business, were utilized in obtaining subscriptions, but they were discontinued after a few weeks. Heads of departments, district managers and in fact all employees are supposed to do all they can in a general way to assist the stock sales department in securing prospective investors. No commissions are paid.

Newspaper advertising and circular letters, plus the efforts of employees, have been depended upon to develop prospects. The manager of the stock sales department was without previous experience in selling securities, and the advertising matter was prepared chiefly by the second vice-president and treasurer.

The partial payment plan calls for purchase of the stock at $90 per share to be paid for in six equal installments of $15 over a period of thirteen months.

Companies under the Management of H. M. Byllesby & Company

Among the management organizations, H. M. Byllesby & Company, as the result of an experience over several years with customer ownership, are firmly committed to the principle. Already the plan is in effect in three-fourths of the cities and towns served by their companies, and it is intended to extend it to the others as rapidly as possible. Since June, 1915, six of the Byllesby companies have distributed about $6,500,000 of 7 per cent preferred stock among upwards of 8,500 resident citizens, in addition to several millions of bonds and notes, the latter usually being placed locally in conjunction with banks and bond dealers. The companies practicing customer ownership are Northern States Power Company, Arkansas Valley Railway, Light and Power Company, San Diego Consolidated Gas & Electric Company, Western States Gas & Electric Company, Oklahoma Gas and Electric Company, and Ottumwa Railway and Light Company.

The Byllesby companies from the start have persistently sought the interest of the wage-earner and the citizen of average means. The work has been a feature of their public policy, and the primary object has been the making of stockholders with supplemental financing as a secondary motive. It has been carried out under the leadership of Mr. O. E. Osthoff, vice-president, and the general supervision of the Bond Department of the managing organization, assisted by other departments and with the cooperation of resident managers and their staffs. Various local methods have been employed, all of them using newspaper and direct-by-mail advertising as a basic feature, but employing a variety of arrangements with reference to the executives and employees handling sales.

In the larger situations separate securities sales departments have been organized, charged exclusively with the particular endeavor. This is also true at places where for one reason or another the work has been particularly difficult. In other cities the resident manager and one or two of his staff personally have placed large amounts of securities and they do not regard special securities salesmen as essential. In one company a successful record was made by the existing department heads in conjunction with an investment banking firm.

The Byllesby companies offer their securities to the public continuously except during Liberty Loan periods. Advertising is done at regular intervals. Intensive campaigns are carried out as occasion demands, but for the most part the effort is steady, persistent and methodical. In no place has the Commercial Department been made responsible for the work, and in only a few instances have the commercial men been asked to do anything other than report prospects and negotiate occasional sales of stock in connection with the financing of extensions. Commercial salesmen have discovered that many times their projects are facilitated by the stock sales policy of their company.

About 25 per cent of the new resident stockholders are made by Byllesby companies through the partial payment plan, but only about 10 per cent of the stock is sold in this way. The partial payment plan in general use calls for a first payment of $5 a share and monthly installments of the same amount. The stock does not become the property of the investor until fully paid for, nor does he receive the dividends during the purchase period, but he is credited with interest at 6 per cent on payments. A certificate resembling a stock certificate is issued as a receipt for the first payment and subsequent deposits are noted thereon.

When the work is inaugurated at a property much care is taken in informing and interesting the executive staff and in utilizing all avenues and possibilities of favorable publicity. The plan is launched as an innovation in public relations and its broad economic features are particularly emphasized. The news and editorial cooperation of the press is requested and a surprising degree of cordiality towards the plan has been the customary response.

The effort of Byllesby and Company is not only to distribute the preferred stock of operating companies as widely as possible among customers, but to secure full advantage of the democratic and popular features of the work, a point never overlooked in the liberal advertising practiced.

For a number of years the securities of Standard Gas & Electric Company, which owns investments in all of the companies under Byllesby management, have had increasingly broad distribution among the public throughout the country, and these securities have been purchased by residents at many local properties.

COMPANIES UNDER THE MANAGEMENT OF HENRY L. DOHERTY & COMPANY

Indicative of the present-day attitude of some of the larger utility operating firms is the action now being taken by Henry L. Doherty & Company in the organization of a special department to have charge of the local sale of securities in the many cities served by utility companies under their management. The Doherty organization experimented with customer ownership at Denver, Mansfield, Ohio, and Toledo with excellent results, particularly at Denver, where $1,500,000 of the 6 per cent preferred stock of the Denver Gas & Electric Company has been distributed among a large number of residents. Apart from the direct sale of operating company securities in their home towns, Doherty & Company have achieved a wide distribution of the preferred and common stocks of their holding company—The Cities Service Company. In many communities served numbers of investors are interested in Cities Service securities.

Mr. W. B. Jackson, assistant manager of the Bond Department of Henry L. Doherty & Company, says: "At Denver, Mansfield and Toledo sales of local company securities are under the direction of district sales managers reporting directly to our Bond

Department and under our supervision. At other points sales have been largely in charge of some official of the local operating company, and, of course, the degree of success attained has been entirely dependent on the attitude of the officer in charge of the sale of securities. We are just now beginning to take up the matter of sales to customers and resident citizens in a practical way, and are now organizing a permanent Customers Sales Department, which we hope to have in effective operation within a short time. We believe from our experience that this work must be carried on through a department devoted solely to extending and looking after it."

This organization has worked out a partial payment plan for the various forms of securities issued by Cities Service Company which, no doubt, extends to the operating units. This plan is based upon immediate ownership by the investor of the security purchased, the security itself being held as collateral until payments are completed. The investor receives the dividends or interest and is charged at the rate of 6 per cent interest upon his uncompleted payments. For the preferred stock the basis is $20.00 per $100 par value initial payment; monthly installments $5.00 per share; common stock and bankers' shares, one-third of market price initial payment, balance in twelve equal monthly installments; bonds and notes, $10 per $100 face value, initial payment, balance $5 monthly; interest charged is to be equivalent to the yield to the investor, but not less than 6 per cent.

IOWA RAILWAY AND LIGHT COMPANY AND ALLIED INTERESTS

The Iowa Railway and Light Company and allied companies, namely the Iowa Electric Company and the Iowa Falls Electric Company, maintain a Financial Department, which was organized in May, 1913. These companies serve many communities in Iowa and maintain headquarters at Cedar Rapids. The Financial Department is in charge of a fiscal agent at Cedar Rapids, branch offices being maintained at Marshalltown and Boone. Three securities salesmen devote their entire time and energies to the work.

From the time of its organization in 1913 to March 1, 1919, the Financial Department placed $6,325,629 of various forms of securities among citizens in and near the territory served by the

Company. Of this total $3,592,404 consisted of the 7 per cent preferred stock of the Iowa Railway and Light Company. Other securities placed were: Iowa Electric Company, $312,900 7 per cent preferred stock; $214,175 common stock; $1,145,000 20-year 6 per cent gold bonds; Iowa Falls Electric Company, $108,550 common stock; $407,600 5-year gold bonds and $95,000 collateral notes. No exact record of the number of home shareholders or investors is available, but the number is unquestionably large.

This is one of the most conspicuous examples on record of the successful distribution of securities in home territory. It is particularly interesting not only because of the volume of financing, but by reason of the location of the field covered, this being comprised of medium and small-sized cities, towns and agricultural districts in a state where the people have not had a long or extensive experience with investments in corporation stock and bonds. The variety of securities put out direct by the organizations also is of special interest.

The cost of marketing the securities varied with the character of the offering. The cost of handling the preferred stock of the Iowa Railway and Light Company over the six-year period is about $6 per $100 share. Salesmen are paid on a commission basis, the percentage ranging from 2½ per cent to 7½ per cent. Salesmen earn $2,000 to $8,000 a year. Company employees are paid a commission of 2 per cent on sales closed as the result of prospects developed by them, but an inconsiderable amount of business comes from this source. Banks and brokers are allowed 2 per cent on sales which they may make.

Various plans are used to develop inquiries—newspaper advertising, direct-by-mail effort and personal canvassing. A very simple partial-payment plan for buying the preferred stock is in effect, the minimum rate being $5 per share per month. A card duplicate of the agreement is given the investor for his receipt and subsequent payments are receipted on the reverse of the card. Interest is allowed, payable quarterly, at the rate of 7 per cent, and the interest may be applied on the principal. Whenever the payments equal the price of one share of stock, the share is to be issued and delivered. If an investor desires to withdraw his capital before the payments are sufficient to purchase one or more shares of stock, the payments shall be returned to him with interest at the rate of 5 per cent.

NORTHERN STATES POWER COMPANY

Northern States Power Company not only markets its 7 per cent preferred stock continuously in its territory, but concentrates upon this particular form of security to the exclusion of bonds, notes, common stock, etc. Bonds and notes of the company are distributed locally to a limited extent by investment banking houses. This company serves Minneapolis, St. Paul, Stillwater, Mankato, Faribault, Fargo, Grand Forks, Minot, Galena and about 190 other cities and towns of the central northwest. It began selling preferred stock to its customers and resident citizens in June, 1915, and now has upwards of 6000 home shareholders, who own about $4,600,000 of the 7 per cent preferred stock.

This company maintains two securities departments with offices in Minneapolis and St. Paul, in charge of managers at both places. About 15 salesmen are regularly employed on a drawing account and commission basis, the commissions ranging from 2½ per cent on orders up to and including five shares to 1½ per cent, according to the character and amount of the sales. Inquiries are developed by newspaper advertising, direct-by-mail circularization, the suggestions of shareholders, from coupons on service bills, leads from executives and employees of other departments, window displays, etc. No compensation is given employees suggesting prospects. Salesmen visit cities and towns outside of Minneapolis and St. Paul from time to time. Division managers and auditors make direct sales.

The company's advertising methods are notable for their democratic character, the appeal nearly always being to wage-earners. Advertisements invariably carry inquiry coupons and circular letters contain an unstamped return card. Inquiries are followed up by an information sheet, an illustrated descriptive booklet and a salesman's personal visit within two or three days. Inquiries from a distance are handled by personally dictated sales letters, no form letters being permitted. Cost of selling varies according to the general situation affecting investment capital. Stock is sold at prices corresponding with market conditions.

UNION ELECTRIC LIGHT AND POWER COMPANY, ST. LOUIS, MO.

The experience of the Union Electric Light and Power Company of St. Louis is a successful example of the campaign method of distributing securities locally, as opposed to the continuous selling method. It is also of unusual interest because the sales were made by employees of the company, the Commercial Sales Department being utilized particularly and no special securities salesmen being used. In 1917 and 1918 this company sold direct to its customers $1,961,356 of its 7 per cent preferred stock, thereby adding 2,585 citizens to its list of shareholders. The average investment was 6.86 shares per individual. The total cost of selling amounted to but $1.22 per share, and the stock was sold at $102.

The Union Electric Light and Power Company also markets its interest-bearing securities among the local public, selling such securities through the banks. In 1918, $1,800,000 of two-year, bond-secured 6 per cent notes were distributed in this manner.

The preferred stock sales were conducted under the supervision of the secretary and treasurer. All employees were requested to solicit subscriptions. The contract solicitors of the Commercial Sales Department did a considerable part of the work. Newspaper advertising and personal solicitation of employees were depended upon to produce results. A commission of 1 per cent was paid employees for sales made directly by them, the average earnings per employee affecting sales from this source being $47.35. While the results obtained from utilizing existing departments were very satisfactory, these efforts interfered somewhat with their regular duties. Teams were organized in the various departments and a premium paid the team securing the greatest number of subscriptions.

Installment plan called for $10 per share at $102 with subscription; balance at the rate of 10 per cent per month with monthly service bill. Interest is paid quarterly at the rate of 5 per cent, company agreeing to refund all moneys received prior to final payment if desired by investor.

COMPANIES UNDER MANAGEMENT OF HODENPYL, HARDY & CO.

The Hodenpyl, Hardy Companies utilized the customer ownership principle during the war as a means of financing extensions to gas and electric customers. Other companies selling their securities locally did the same to a limited extent, but this was the only manner in which the Hodenpyl, Hardy companies sold their securities direct, no general advertising or selling methods being used. These companies—the Consumers Power Company of Michigan, the Michigan Light Company, Central Illinois Lighting Company, Northern Ohio Traction and Light Company, Public Utilities Company (Evansville, Ind.), and the Springfield (Ohio) Light, Heat and Power Company—collectively disposed of $307,900 of 6 per cent preferred stock among 363 of their customers. The stock sales were handled by representatives of the Commercial Department.

A considerable amount of the securities of these companies has been purchased in the past by their customers through investment banking houses.

CENTRAL MAINE POWER COMPANY

Central Maine Power Company, with headquarters at Augusta, serves 83 cities, towns and villages, with a total population of 150,000, no town having more than 15,000 people. Practically all of its many shareholders reside in the territory served. It encourages home ownership both by the direct sale of its 7 per cent preferred stock to residents and all of its securities through investment banking houses. For some time special efforts have been made by the Company in the direct sale of its preferred stock at a price of $107.50 per share, with gratifying results. The stock is sold continuously, sales being stimulated from time to time by special drives or campaigns. Employees of all departments are utilized and one special securities salesman as well. An interesting plan of employees' stock selling contests has been worked out, supported by the Company's weekly publication. Certain employees, particularly Commercial Department representatives, relinquish their customary duties when engaged on stock-selling drives.

The advertising manager of the Company is in charge of the campaign salesmen and of employees' selling contests. The campaign salesmen are recruited principally from the housewiring salesmen. In the employee contests, sales have been made by employees as follows: District superintendents, 32.5 per cent; town representatives, 24.4 per cent; department heads, 12.9 per cent; linemen, 4.5 per cent; inside wiremen, 4.7 per cent; retail salesmen, 4.3 per cent; station operators, 4.1 per cent; common laborers, 3 per cent; women employees, 3 per cent; engineering department, 2.6 per cent; construction and line foremen, 2 per cent; street railway men, 2 per cent. These figures include both employees' sales and amounts purchased for themselves.

In the stock selling contests every employee is qiven a quota, depending upon his job and his probable opportunities to sell. Department heads are given a quota of fifteen shares, to be sold in a contest of two months' duration; town representatives, 7 shares; linemen and station operators, 2 shares, etc. Many small prizes are offered, chiefly in thrift stamps, to the value of about $100, some paid weekly, some for the entire contest. The employees' weekly publication is used to publish descriptions of the plan, instructions how to sell, standing of contestants, names of winners and matter to keep up interest. Liberal advertising is done in the newspapers. Before a campaign is started in a town, the ground is prepared by the advertising, and the town representatives check over the customers and make a list of prospects. Usually a personal canvass is made of about 25 per cent of the Company's customers. The advertising is found useful in convincing people of the merit of the investment. Employees receive 50 cents per share on sales made to prospects whom they develop but to whom someone else sells.

The total cost of selling averages about $5 per share. Stock is sold on installments as well as on cash basis—to the public at the rate of $10 per share per month and to employees practically on terms to suit themselves.

EDISON ELECTRIC ILLUMINATING COMPANY, BROCKTON, MASS.

The laws of Massachusetts are not conducive to customer ownership. Not only is the general principle strictly enjoined that any new issue of stock must first be offered to the existing shareholders, but it is prescribed that if the shareholders do not buy the new stock it must be sold at auction. Nevertheless, one Massachusetts company—the Edison Electric Illuminating Company, of Brockton—has proved that the customer ownership method may be applied with an interest-bearing security as a medium as well as with shares of stock, which do not have a day of maturity payment like bonds and notes.

In the winter of 1917-18 this Company executed a spirited and successful campaign for the local distribution of its two-year 6 per cent gold coupon notes, sold at a price to net the investor 7.14 per cent. The campaign was conducted by the head of the power sales department, assisted by two power salesmen, and with the cooperation of all departments. Newspaper advertising was employed extensively. Total sales were $251,900 par value to 768 residents—an average distribution of $328 per investor, this latter fact being a remarkable commentary upon the good advertising and salesmanship employed. No commissions were paid. The cost was less than 1 per cent.

SOUTHERN CALIFORNIA EDISON COMPANY, LOS ANGELES, CAL.

A remarkable success in customer ownership was achieved by the Southern California Edison Company (serving a population of over 1,000,000) in the latter part of 1917. This effort is notable in at least four respects: (1) The security distributed was the common stock of the company which is preceded both by preferred stock and interest-bearing securities; (2) the total selling cost was but 16 cents per share; (3) the task was accomplished by thorough cooperation of all departments of the company plus newspaper advertising and some assistance from the banks, and (4) out of the $3,000,000 of common stock distributed, $2,782,000 was placed in a six weeks' campaign.

Offsetting, but by no means depreciating, these results is the fact that of the 1946 new shareholders—residents of Los Angeles and surrounding towns—added to the Company's books more than one-half were executives and employees of the Company. Obviously when such a large proportion of the investors are from the ranks of the organization, and when the selling effort extends over so short a time, the effect is bound to reduce the selling cost per share. Many of the other companies submitting data have sold but a negligible amount of securities to employees, the great majority of the new shareholders not having been connected with the company in any way.

In the opinion of the Southern California Edison management, newspaper advertising, preceded by a complete circularization among the company's customers, was responsible for at least 60 per cent of the sales made to the public. About 15 per cent of the total sales were made through 53 banks, cooperating with the Company, with no consideration excepting the temporary increase of deposits and a degree of advertising, all of the banks being depositaries of the Company. No appreciable success rewarded the effort of local brokers to handle the securities on a 1 per cent commission basis.

The Company began selling stock to its employees and customers in August, 1917, and discontinued the following November to avoid any possible competition with the Government war financing. The common stock offered has paid dividends at the rates of 5 per cent and 6 per cent per annum since 1910, and since June, 1917, at the rate of 7 per cent. It was offered to the local public at $89 per share for cash and $90 per share on the installment plan. The price to employees was $88. Although the campaign closed in November, 1917, during 1918 customers of the company purchased $218,000 of the stock. The total number of common shareholders was increased from 1346 to 3292, and the average holdings decreased from 81.79 shares per individual to 49.6 shares.

The campaign was personally supervised by the comptroller of the Company, who established permanently a small Securities Department, comprised of a manager—a young man formerly in the Commercial Sales Department, but without financial experience—an accountant, and, temporarily, three salesmen from the Commercial Sales Department. The Securities Department issued the stock, handled payments, gave out information, had charge of mailing of dividends, etc. It may be said, however, that the Company's entire force, in a way, became a sales organization, as prior to opening subscriptions meetings were held in all of the Company's twenty-odd districts, at which practically all employees were in attendance, and the plan of the campaign was carefully explained to them, not only as to sales to the public, but sales to themselves as employees. The assistant agents, or local managers, became direct sales representatives and contributed a great deal towards the success of the campaign. About one-third of the Company's employees became shareholders. A carefully prepared newspaper advertising program was carried out in Los Angeles and all districts served by the Company. A printed circular describing the plan was personally distributed to all customers by meter readers, salesmen on their rounds, etc., who did not attempt to secure subscriptions, but merely called the recipient's attention to the literature and supplied information upon any point inquired about. As a result of the employees' meetings—some lasting for hours—practically everyone connected with the Company became well informed regarding the stock and the financial status of the organization. They thereupon cooperated effectively in making the campaign a success, largely by "boosting" and locating prospects. The newspaper advertising was not started until after the meetings had been held and the circulars distributed. The whole effort was a fine example of carefully worked-out and well-executed coordination of the latent abilities of the Company's personnel.

A partial-payment plan was part of the arrangements, the initial payment being $5 and monthly installments $5 per share. Interest at 6 per cent is paid on installments. Actual stock certificates are issued quarterly on the dividend date, a check being issued for interest and accumulated dividends.

ARKANSAS VALLEY RAILWAY, LIGHT & POWER COMPANY, PUEBLO, COLO.

A feature of the development of the customer ownership plan by the Arkansas Valley Railway, Light & Power Company is the fact that the sales were made both directly by the Company and by a leading bond dealer. Since the work was started in September, 1917, $535,900 of the Company's 7 per cent preferred stock has been placed among 1025 residents of Pueblo and the twenty surrounding cities and towns served by the Company. The Company, without a special securities sales department, sold 71 per cent of the stock and 76 per cent of the new shareholders. All of the advertising, circularizing, etc., was done by the Company, this advertising referring the reader both to the Company and to the bond dealer, designated as fiscal agent. The latter also handles a considerable quantity of the Company's bonds and notes.

The success of this Company's endeavor has been due largely to the vigorous and sustained cooperation of all departments. Twenty per cent of the sales and 10 per cent of the stock were disposed of by the Commercial Department, but all department heads, district superintendents and a number of other employees made sales. A commission of 2 per cent was paid. About 16 per cent of the total stock sold was on the partial-payment basis. When this movement was initiated the local newspapers extended cordial cooperation both in their news and editorial columns. The total cost of selling has been about $5 a share.

ROCHESTER RAILWAY & LIGHT COMPANY, ROCHESTER, N. Y.

The Rochester Railway & Light Company sold $1,000,000 of its 7 per cent preferred stock direct to 1520 residents in 1918. The campaign method was employed, and no special securities department or securities salesmen were utilized. The selling cost per share, including every item of expense, printing of stock certificates, revenue stamps, tax, etc., was $2.96. Of the total amount of stock sold, $826,000 was disposed of for cash and $173,000 on partial payments.

Newspaper advertising was the largest single item of expense, amounting to $1.40 per share. Advertising in magazines, street cars, etc., amounted to $.326 per share. A commission of $.50 a share was allowed to all employees, except officers appointed by the board, on all signed subscriptions brought in. The sale was in direct charge of the vice-president and treasurer. Before the campaign every banker and broker in Rochester were interviewed and permission secured to use their names in advertising. They "boosted" the securities from every standpoint and were allowed a commission of $1.00 per share on all sales. The collective sales of the brokers, however, amounted to less than 30 shares.

Three hundred dollars in cash prizes were offered to employees, as follows: $100 first cash prize for the largest number of subscriptions received by one employee; $50 for the second largest number; $100 for the largest amount received in subscriptions by one employee and $50 for the second. The same man won the two first prizes by his zeal in following up prospects outside of business hours. Two salesmen for the Commercial Department were used to close prospects whom other employees found difficult and to follow up special leads. "We do not depend upon any specific source for the production of inquiries," says the management. "We advertised, developed prospects, found that shareholders exhibiting dividend checks brought subscriptions, and used every legitimate, dignified method of appealing to the different characteristics of the people as they might appear. People in every walk of life were subscribers. We had Pullman car porters, clergymen, bartenders, barbers, policemen, bankers, hundreds of women—all expressing through their subscriptions absolute confidence in the security."

The management does not believe that a special securities department is at all necessary to make a success of this work.

Stock is sold on the installment plan to the public at the rate of $10 per month per share; to employees at $5 per month per share. Interest at 7 per cent is allowed on payments regardless of whether they are carried through to completion or the amounts withdrawn.

An analysis of expense submitted by the Company is particularly interesting, as follows:

Sale of 10,000 *Shares of 7 Per Cent Preferred Stock.*

	Amount.	Per Share.
Salaries per pay rolls	$ 2,784.48	$0.278
Commissions	2,717.00	.271
Prizes for largest sale	300.00	.030
Advertising—newspapers	14,018.26	1.401
Advertising—magazines, street cars, etc.	3,266.36	.326
Automobile expense	628.50	.062
Printing circulars	1,355.06	.135
Printing Gas and Electric News	2,936.50	.293
Revenue stamps and tax	343.90	.034
Printing stock certificates	1,100.00	.110
Miscellaneous stationery and expense	506.32	.056
Total Feb. 28, 1919	$29,956.38	$2.996

The management says: "Please consider in the foregoing amount of $29,956.38 that we laid the foundation for a brand new financial policy. Probably one-half of this amount will cover the future campaigning, commissions, etc. Please note that $2,000 of this amount—the last three items—is for expenses which in no way could be construed as expenses of selling as they would obtain in any form of security.

ELECTRIC BOND AND SHARE COMPANY

Eight of the companies under the direction of the Electric Bond and Share Company are selling their preferred stocks direct to customers and resident citizens. Effort was begun in August, 1917, and has been carried on continuously since then, with the exception of the periods during which Liberty Loan subscriptions were solicited. Up to April 24, 1919, $1,698,500 of preferred stock had been distributed among the local publics, there having been 3,454 sales.

These companies sell both for cash and upon the partial payment plan, the purchase price of the stock in both instances being the same. The partial payment plan provides for the payment of 10 per cent monthly. Partial payment subscribers receive interest upon their payments and have the right to withdraw all payments prior to the date of final payment, including the interest thereon.

Meetings of all employees are held at various times and all are requested to participate in the selling of the preferred stock. Experience has been that the Commercial Departments have done very effective work, but other departments have also contributed substantially to the success achieved. A small commission is offered to all employees making sales. It is the intention of the organization to continue selling preferred stock locally indefinitely, and the plan will be extended to all the companies under Electric Bond and Share Company management as soon as possible.

BUFFALO GENERAL ELECTRIC COMPANY, BUFFALO, N. Y.

While the Buffalo General Electric Company does not sell securities direct to its customers, it has worked out an effective form of cooperation with an investment banking house, which has placed $1,000,000 of 6 per cent convertible debentures among 450 residents. The investment banking house was supplied with a list of the Company's customers, which it circularized under its own name to excellent advantage.

IOWA GAS & ELECTRIC COMPANY, WASHINGTON, IOWA.

Since January 1, 1917, the Iowa Gas & Electric Company has distributed $109,000 of its preferred stock among 160 residents, the personal selling being done by the president and manager and office employees. No special salesman has been used. The effort was launched with newspaper advertising, and once a year a circular letter is sent to all customers. On dividend dates letters regarding the stock, the Company and its affairs, etc., are enclosed with checks. In one case a transmission line was financed through stock sales to the people to be served. A commission of $2.00 per share is paid to the bankers; none to employees.

H. F. Derbyshire, general manager, says: "In smaller communities, where the Company management is generally known, the managers can sell stock where the average commercial man cannot. The smaller the community the more the people want to deal with those in authority, and we find this has been the general rule with us."

OHIO SERVICE COMPANY, COSHOCTON, OHIO.

The Ohio Service Company, which serves Coshocton and more than twenty other communities, has acquired 231 home shareholders within the past year, the average holdings being a trifle more than 4 shares of the company's 6 per cent preferred stock. The work has been carried out under the personal supervision of the manager without creating a special securities sales department. Commercial salesmen, superintendents and men from outside the organization have been utilized in the sales work.

Newspaper advertising, circular letters and pamphlets have been used extensively to develop prospects and prepare the way for the company's representatives. It has been found that commercial salesmen require much special instruction in order to sell stock successfully. Commission paid to employees, $2.00 a share; to outside agents, $3.50 per share. Total sales cost per share about $5.00. A well-developed partial payment plan was placed in effect, a little more than 10 per cent of the stock being sold in this way. Outside agents include young lawyers, secretaries of chambers of commerce, etc.

MAHONING & SHENANGO RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

This company, operating in Youngstown, Ohio, and surrounding territory, has succeeded in selling its 7 per cent preferred stock locally under extremely adverse conditions, including controversies over increased rates and street railway fares. Since November, 1917, it has distributed nearly $500,000 of the preferred stock among about 800 residents.

The work has been carried on principally under the direction of the assistant manager of light and power. A separate department was organized for the purpose, the duties of this department including the keeping of books and records, general statistics, insurance and real estate records, etc. The sales force was recruited from the organization, several men being taken from the New Business Department. Besides the manager of the department and an office man an average of three salesmen are employed. Some of the salesmen work on a straight commission of $4 a share; others on drawing account and commission basis. Salesmen employed from outside the organization have had little success. Bankers, employees and others who suggest prospects receive $2 a share commission. The partial-payment plan is similar to those used by other companies. The management believes that stock sales can be handled best by a separate department devoted to the purpose.

DAYTON POWER AND LIGHT COMPANY, DAYTON, OHIO

The Dayton Power and Light Company furnishes the only example, so far as known, wherein the local sale of stock has been turned over exclusively to the Commercial Department. This department required but a short time to place $135,500 par value of 6 per cent preferred stock among a considerable number of residents. The campaign was started June 1, 1918. Total cost of selling, including advertising, salesmen's regular salaries and issuing and transferring stock, was $1.25 a share. No commissions were paid. Advertising was depended upon to produce inquiries. Partial-payment plan called for $10 per share initial payment and $15 per share per month. About 10 per cent of the stock was sold on the partial-payment basis.

Milwaukee Electric Railway & Light Company, Milwaukee, Wisconsin

This Company, together with other companies constituting the subsidiaries of the Wisconsin Edison Company, believes in the distribution of its securities among the public served by the companies, and sells such securities directly to the public. The organization accomplishes the work mainly by advertising, supplemented by personal solicitation, and utilizes the commercial sales organization only as an auxiliary and not as a primary effort. The company inaugurated the practice in 1916 and has sold the following securities:

7 %	5-year secured gold notes	$1,820,000
7 %	preferred stock	425,000
6½ %	5-year secured gold notes	300,000
5 %	first mortgage gold bonds	92,800

APPENDIX B

REPORT OF COMMITTEE ON THE SALE OF COMPANY SECURITIES TO CUSTOMERS AND RESIDENT CITIZENS

Views Regarding Selling Organization

The diverse views as to the best methods of security selling organizations are reflected in the following expressions:

Mr. A. F. Hockenbeamer, second vice-president and treasurer of the Pacific Gas & Electric Company, following nearly five years' experience in the sale of $8,359,300 preferred stock to the local public, says: "There is no doubt in my mind that the salesmen in central station Commercial Departments can be made a highly effective means of selling securities to customers. I would not, however, exclude other branches of the service. In our campaigns men and women in all branches have done effective work in establishing contacts between customers and our Stock Sales Department or other offices authorized to receive subscriptions. There may be some danger also in lessening the efficiency of a commercial organization by requiring it to divide its efforts along two totally distinct lines, and after all I believe every employee should utilize the opportunities to discover prospects that may come to him in the performance of his daily routine and without requiring any great departure from this routine. It is advertising that really creates the demand, and my view of the function of employees is that they are merely agencies for bringing prospects and the Stock Sales Department in contact with each other. If, however, employees are expected to go out and actually close trades, they should first be educated. Court decisions have quite definitely given means of redress to purchasers of securities bought on misrepresentation or misstatement of facts, and my feeling is we must be careful in the selection of employees to whom actual sales are entrusted. This in turn presupposes a course of instruction that will enable employees selected for this work to answer questions correctly and intelligently."

An officer of the Rochester Railway and Light Company says:

"I do not think it is at all necessary to organize a separate department. I should rather have the eleven hundred employees of the company, zealous to get their commissions, learning every detail of the Company's financing and spreading the propaganda in their various fields. This is worth as much to us as selling the stock."

After the sale of $3,000,000 of the Company's common stock to nearly 2000 employees and residents, Mr. A. N. Kemp, comptroller of the Southern California Edison Company, says:

"I am of the opinion that where a public utility desires to place its stock direct with its consumers and the general public it serves it should not have salesmen or other employees who are doing certain work also try to sell the company's securities as a side issue, nor should brokers be allowed to peddle the stock. The proper selling of securities needs as much training, if not more, than selling any other commodity, for the reason that the average consumer of a power company who has $1,000 or $2,000 on hand to invest, representing hard-earned savings, is not going to invest those savings on the strength of a short talk given by some power or light salesman, after interviewing him on other business.

"However, when such a man as the company's district agent or some similar local representative known to the consumers and the public interviews a prospective purchaser, the purchaser has confidence in such a man and will accept his statements as to the worth and stability of the securities almost without question.

"In any large city that is served by a public utility, it might be advisable to take one of the salesmen of the company who knows the properties thoroughly and give him a good grounding in the value of the securities that are to be sold, and of financial matters in general, so that the many inquiries which come into the main office in that particular city can be taken care of by someone who is devoting his whole time to the work. The city salesman should be of heavy enough calibre to be able to interview the big business men of that city."

Mr. Percy H. Whiting, advertising manager of the Central Maine Power Company, says:

"I should doubt if commercial representatives could profitably make a regular practise of spending part of their time on stock selling. It is hard to flop from one job to another. Of course, in a contest such as we run, any one man spends only a comparatively short time on stock selling. When our commercial representatives go in for stock selling they drop their other work. I think our plan of developing stock salesmen from our own force, when possible, and of paying some stimulative quota-and-bonus plan works out fairly well. I think that any fairly good salesman, given a fair training, can sell a good security if he can work after the field has been prepared by good direct and newspaper advertising."

Mr. A. C. Hall, secretary of the Southern Illinois Light and Power Company, which has upwards of 400 home shareholders among the 65 communities served by the organization, says:

"I doubt the suitability of regular commercial department representatives for work of this character, as the selling of preferred stock is a work requiring the service of a specialist. Compensation should be on a commission basis, as that naturally gives the proper incentive."

Mr. C. H. Howell, manager The Ohio Service Company, Coshocton, Ohio, says: "In our judgment this movement of distributing public utility securities among customers is one of the greatest movements inaugurated as a solution ultimately to the problem of municipal ownership. We have not allowed our stock to be distributed to our customers and friends by stock salesmen or stock brokers, but choose, first of all, the representations of our own men who are trained to deal with the public utility customers, bearing in mind that the sale of a few shares of stock is not by any means the whole end to be gained. We have already begun to feel the good effects of distributing our stock among our customers, and it is our intention to continue this work indefinitely. I plan to educate intensively a few of our commercial representatives as a sort of combination stock salesmen and public policy men to devote their time exclusively to the sale of securities. Much is to be gained in a public policy way aside from the actual raising of money by sale of securities."

The Mahoning and Shenango Railway and Light Company is of the opinion that any company which has a security of merit to offer should offer it and can sell it to its own home folks. "It is extremely unlikely," it says, "that any company could be operating under more difficult conditions than we have had during the past two years, and if we have been in any measure successful other companies can certainly do as well. Our suggestion in forming a separate department to take care of the work would be to select somebody in the organization who seems to have sales and organizing ability and faith and confidence in his company and put him at the head of the department and allow him to build up a sales force, using wherever possible men or women already in the employ of the company. A straight commission proposition is undoubtedly the best thing for the company and for the salesman if he has confidence in himself."

Mr. O. H. Hutchings, associate general manager of the Dayton Power and Light Company, the only company which has sold stock locally exclusively through its commercial department, says:

"We are heartily in favor of public service corporations selling their securities to their customers and believe that this is work that should be undertaken by the men in the Commercial Department, although we appreciate that all employees can be a big factor in the success of the sale of stock to customers. We believe that the commercial representatives should sell the securities in the same territory in which they are expected to obtain the regular light and power business, and that they should be compensated as they are for light and power business; that is, if they are paid on a salary basis no extra remuneration should be made, but if on a commission basis, some plan should be worked out along the same lines as the regular commission scheme."

Mr. E. F. Stone, superintendent of the Lighting, Power and Sales Department of the Arkansas Valley Railway, Light and Power Company, Pueblo, Colo: "There are many advantages in handling the sale of securities through the Commercial Department representatives. It has a tendency to broaden the salesmen and enable them to leave a better impression with customers, due to being in position to converse with them on any subject pertaining to the company's affairs. It is an advantage to the salesmen to become familiar with the operating statistics and financial condition of the company. The work gives them a diversity from the constant grind of the sale of service and merchandise, and this, in my opinion, makes them better salesmen for both securities and their ordinary line.

"In order for the representatives of the Commercial Department to be successful in the sale of securities they must be properly instructed. It is necessary to hold periodic meetings, to exchange ideas, to discuss unusual questions propounded to them and to receive direction and advice. One feature of customer ownership, as we understand it, is to make shareholders of the wage earners and people of small means. This necessitates taking small orders upon which as much time may be spent as on a large order. It is difficult for a security salesman to sell enough stock in small orders for him to earn a living income. The commercial salesman, however, can frequently pick up orders of this kind both to the advantage of himself and his company.

"The Commercial Department in any company should be a valuable factor in the sale of securities. I believe, however, that it would be well for a specialized securities sales force to be given the field periodically to work among the bankers and larger investors and incidentally to stimulate the local sales force with new ideas of salesmanship."

The President: This report is now in your hands for discussion.

F. L. Dennis, South Bend, Ind.: I would like to inquire what means are taken by the companies that are selling their securities to the public, including their customers and resident citizens, to maintain the price or stability or market ability of the securities in their vicinity, whether it is necessary to have the influence of banking interests in doing this, or whether the utility itself is able to maintain a fairly reasonable sale price in its community for purchasers to sell back or dispose of the securities in case of necessity. I would like to ask if there are any members who can give information along that line.

H. E. Young, Minneapolis: In the case of stock sold to customers or other residents of the city, if the holder is obliged to part with the stock, we buy it in order to keep the price stable. That is the way we aim to handle that matter in all cases. There is not so much of it on the market but that we can keep it under control and buy it in at the proper price.

Charles R. Price, New Bedford, Mass.: I know of an arrangement by which it is agreed that the purchaser of the stock is obliged to offer it to the company for sale, before he puts it on the market.

THE PRESIDENT: If there is no further discussion I will ask Mr. Learned to sum up.

MR. LEARNED: I must confess that I am not in a position to sum up the discussion on this subject. I have simply had the privilege of reading the report and am not sufficiently familiar with the details to make any reply to the questions which have been asked.

R. H. BALLARD, Los Angeles, Cal.: The question as to the sale of stock to consumers was, I think, whether or not the company made any separate arrangement with the purchaser that it would, if necessary, buy the stock back from the purchaser. I know of no such arrangement, and do not think that such an arrangement would be practicable in selling stock generally. Stocks in general in public utilities, as I understand it, are sold on their investment merits. For instance, the matter of the market price on the stock is not so important as the maintenance of the dividends in order that the company may make absolutely good with the consumer or the public generally to whom it has sold stocks, that the purchaser will receive a certain rate of interest, dependent upon the amount of money which he has invested. In most cases that is satisfactory irrespective of the market price of the stock.

MR. PRICE: Take payment in stock?

MR. BALLARD: Yes, that is also done.

K. F. WEIGAND: What is the most practicable way for a company to start out on customer ownership of its securities in the case of a new company? Can anyone here give us information on that point?

THE PRESIDENT: We will have to leave that for the present, I am afraid, Mr. Weigand.

We will now proceed to the Report of the Public Policy Committee, W. W. Freeman, of The Union Gas & Electric Company of Cincinnati, Chairman.

REPORT OF PUBLIC POLICY COMMITTEE

By W. W. Freeman, *Chairman*.

Mr. President, Ladies and Gentlemen: The report of the Public Policy Committee tonight will be entirely oral and very informal in character. There are several reasons for this action, aside from the fact that possibly the Chairman is not as fond of writing reports as he may have been some years ago.

You have already had one written report from the Committee in the nature of an interim report, some two or three months ago, outlining the suggestions and views of the Committee with regard to the reconstruction program, and to those who have read that report the views of the Committee are already known. Furthermore, as the Committee has been in session since half-past six this evening, and has just adjourned in time to come to this meeting, the Chairman of the Committee has hardly been in position to know the views of the Committee and has been without authority to express them until it was too late to make any special preparation for this meeting.

I have no doubt that the thought uppermost in our minds as we have returned to Atlantic City for another convention is the striking contrast in the conditions under which we met a year ago and those of today. At our last convention the dominant purpose was the winning of the war, and every consideration that was not regarded as directly contributory to that result was brushed aside as of little importance. It seemed then that we had ahead of us a long and desperate struggle in which vast sacrifices of life and property were inevitable. But the determination to pay any necessary price in order to win was everywhere evident. Thanks to the indomitable bravery of our soldiers, and to a plan of preparedness which, though late in starting, was overwhelming in its scope and in its initial performance, the spirits of determination manifested in last year's convention was months ago crowned with success.

And now that the war is over we are free to start afresh with plans for a renewal of business activities and for a renewal of business success.

It is in recognition of this fact and this thought that we meet this month in what we may perhaps term, an "old-time" convention, and the spirit of this convention, I am sure, is one of earnest and enthusiastic desire to renew activities along all lines of business effort, not without caution, but with confidence in the future.

In the various sessions which are being held we are discussing the problems which are perhaps of the most importance for immediate solution, and for the restoration of pre-war conditions so far as practicable; and in the presentation of the papers and reports, and in the discussions concerning them we will have the experience and the judgment of our members which, as is always the case, will be illuminating and instructive.

The Public Policy Committee has one subject to suggest tonight as being of such importance as to justify our very serious and special consideration, not only in this convention, but throughout this year. It is not a new subject, not unfamiliar to you, although it has several angles. It was mentioned in the address of the President this morning; I refer to the question of socialism.

The American people are undoubtedly loyal to fundamental American principles, but the menace of socialism, it seems to us, consists chiefly in the lack of appreciation of many of our people as to what socialism really means and is. If the people understood the underlying motives and purposes of socialism that menace would not exist, or at least it would be greatly minimized.

We are inclined, it seems to us, to belittle this subject, because of lack of knowledge, as I have said, as to its true scope. The word itself is not unpleasant, but socialism as enunciated clearly by its recognized apostle, Karl Marx, and as understood and announced by the recognized leaders in socialism in this country and elsewhere—and this is the thing we must get clearly in our minds and the minds of the people—is absolutely the antithesis of every fundamental doctrine of American government. It violates every doctrine as expressed in the Declaration of Independence and in the Constitution of the United States.

Another thing that we should realize and recognize is that there is no distinction between socialism and Bolshevism or

I. W. W.'ism, which many people appear to think there is. Socialism is the parent and the pattern of these other isms, and any person who claims to be a socialist, but who claims to be out of sympathy with Bolshevism or I. W. W.'ism is necessarily ignorant or insincere, and consciously or unconsciously is guilty of sedition.

These are the facts which we must realize if we are going to protect our properties and our civilization. The basic principle of socialism is the denial of all property rights. As one writer has expressed it, it is absolutely the elimination of individuality. It ignores absolutely every element and every characteristic that makes the difference between *the* man and simply *a* man.

Another thing that we must bear in mind and understand is that the apparent pacific and peaceful methods, if I may so term those of socialists as compared with the revolutionary methods of the Bolshevists in Russia and elsewhere, is imaginary rather than real, and is a question of policy rather than a question of principle.

Underlying the doctrines of socialism are essentially the purpose and the desire to override all fundamental government, all constitutional government, and to utilize force and all methods of strife to accomplish their purpose whenever in their opinion the time is ripe. It is perhaps not generally known, but is a fact that Haywood, whose name is familiar to this country because of his past deeds in the city of Jersey City, when speaking to an audience of socialists during the strike of the textile workers, I think in Lawrence, Massachusetts, deliberately stood upon the Stars and Stripes during his speech, and made the statement that the American Flag was fit only for laboring men to wipe their feet upon. That was an inflammatory speech of a man whom we call an I. W. W., but who is at heart, and fundamentally, a socialist, and that speech is not the result of any influences outside of socialism, but the result of the teaching which he received as a socialist.

I am merely introducing this subject, and not attempting to speak upon it at any particular length.

Now, one of the elements of socialism, which affects our interests most directly, is the advocacy of municipal ownership.

Municipal ownership when advocated as an economic question is in the opinion of many of us not particularly dangerous, but from the standpoint of socialism it assumes a very much greater menace; in other words, the man who thinks he is concerned merely in the economic issue, who is not in favor of the public taking over these properties unless he sees in that action a direct financial advantage to the public and to the community affected, that man can be reached when shown that economically, and economically alone, municipal ownership is not a success; but the man who advocates municipal ownership because he believes in the socialization of these properties is going to continue to advocate that doctrine, because irrespective of any financial considerations he wants to accomplish his purpose for other reasons.

We have therefore two elements to contend with in regard to municipal ownership, the one, if we are correct as to our belief, very much easier to deal with than the other, and to the extent to which we can separate these influences and prevent their combination, we are accomplishing a great deal in our own interest and the interest of those we serve.

There is a great deal of propaganda in favor of socialism and in favor of municipal ownership. The problem of counter-propaganda either national in character or local in character, is one which has had the thought of your Public Policy Committee, I think I may say almost continuously, but we are not prepared to make any definite or specific recommendations as to a plan of action. That may come in the near future. But we do wish to point out the importance of our member companies informing themselves upon these questions, for, without being informed ourselves, we obviously cannot pass on effective information to others.

THE PRESIDENT: Our next business is the report of the National Committee on Gas and Electric Service, of which Committee Mr. John W. Lieb, of New York City, is the Chairman. Owing to sudden illness, Mr. Lieb is not able to be with us tonight. I think this is probably the first convention that he has missed for a number of years. However, one of the members of the Committee, Mr. Charles L. Edgar of Boston, who has been very closely associated with Mr. Lieb in all of this work, will present the report.

Mr. Edgar: Mr. President and Gentlemen: I know you will all join with me in expressing regret that Mr. Lieb is unable to present this report in person. The real compensation for his absence is the fact that we know that Mr. Lieb is improving in health, and I have a letter written by his secretary as late as Saturday afternoon to that effect, but stating that he could not get out of bed. This report is very voluminous, and it is the intention of the Committee to have it printed, after the work is entirely completed, and copies sent around to the various member companies. The report has been abstracted and I will read it as it has been presented to me.

REPORT OF NATIONAL COMMITTEE ON GAS AND ELECTRIC SERVICE

When on April 6th, 1917, the United States declared war on Germany, the difficulties under which the gas and electric companies were operating were very great and still more serious conditions were imminent. The dependence of practically every important industry in this country upon gas and electricity, which had been steadily growing, came to be more thoroughly realized after the outbreak of the world war in the summer of 1914. The new demands upon these utilities during the two years that followed taxed the capacity of the existing plants throughout the country to the utmost.

Our large manufacturing establishments, filled with work for the different European nations engaged in the war, made heavy demands on these utilities for power and light and heat to be furnished with the least loss of time. These demands were successfully met in spite of the increasing difficulties to be overcome.

Unusual quantities of gas were required in 1917-1918 because of the unprecedented winter conditions, and in this same period large quantities of gas were required by metallurgical establishments for many purposes, including the melting and tempering of metals and for the enamelling of parts used in the manufacture of automobile bodies and other equipment called for by the warring nations. In addition the gas companies were called upon to wash their commercial gas so as to enable them to furnish larger quantities of material suitable for the manufacture of explosives, the normal by-products being utilized for the manufacture of fertilizers and to a larger degree than heretofore for the supply of material suitable for the dye industries. The greater part of these latter materials had previously been imported from Germany and the war had cut off this source of supply. Some of the larger gas companies were able to utilize their plants for the manufacture of carbon and "soda lime" for the gas masks used by the United States. Factories of every description, loaded with work to the limit of their capacity, made continual demands upon the electric plants for the furnishing of more and more power, which in turn called not only for the furnishing and installing of more appliances and motors, but also for the building and constructing of additional transmission and supply lines, and the reinforcing of existing ones, as well as the installation of more generating capacity within the plants themselves. All of this had to be done in the face of steadily mounting costs for materials and increasing wages for labor, which also was becoming more and more difficult to obtain.

With this increased demand, felt all along the line throughout the entire country, transportation difficulties soon developed which were still further aggravated when finished supplies began to move toward the ports for shipment abroad. Further additional output of gas and electricity called for the movement of more coal and oil for their manufacture, thus throwing a still greater burden on the railroads, and contributing to the congestion that caused frequent embargoes to be declared at many important points.

These conditions were to become still worse when the mobilization of our armies took place and the establishment of cantonments was begun, with the attendant movement of large numbers of troops and of vast quantities of materials and supplies.

Foreseeing the serious situation, the leaders in these industries brought to the attention of the War Department the vital necessity to the Nation of the continuance of the best and most reliable operating results and the protection of the physical properties from damage so that the supply of gas and electricity might be maintained for heating, cooking and lighting in the homes of the people and for the illumination of the public streets and thoroughfares. More than ever must all factories producing war material be kept going, additional factories would now have to be supplied with power by the electric plants, and the local transportation systems which depend upon electricity for their motive power must be continued in operation to get the workers to and from their places of employment.

Accordingly, a committee composed of prominent, representative men in these industries was formed, suggested by the several National Associations, and in May 1917, its services were placed at the disposal of the Government, through Mr. Howard E. Coffin, Chairman of the Advisory Committee of the Council of National Defense. The stated purpose was to bring about close cooperation between the public utility companies themselves on the one hand, and, on the other hand, to establish close relations between the utilities and the various departments of the Government, that the industries might render every possible assistance to the country in the conduct of the war and cooperate with the various departments of the Government in the most effective manner, and, in order that this might be realized, that the necessary supply of fuel, apparatus and materials should, with the cooperation of the Government, be assured to them, thus providing for their continuous and efficient operation.

This Committee, which became known as the National Committee on Gas and Electric Service, was made up of the following members:

John W. Lieb, Chairman,
Vice-President, The New York Edison Co.
New York, N. Y.

Wm. H. Gartley, Vice-Chairman,
Vice-President, Equitable Illuminating Gas Light Company.
Philadelphia, Pa.

Walter R. Addicks, Vice-President,
Consolidated Gas Company of New York,
New York, N. Y.

Philip P. Barton, Vice-President,
Niagara Falls Power Company,
Niagara Falls, N. Y.

John A. Britton, Vice-President,
Pacific Gas and Electric Company,
San Francisco, Cal.

Charles L. Edgar, President,
The Edison Electric Illuminating Company of Boston,
Boston, Mass.

Alex Dow, President,
The Detroit Edison Company,
Detroit, Mich.

A. E. Forstall, President,
American Gas Institute,
New York, N. Y.

Samuel Insull, President,
Commonwealth Edison Company,
Chicago, Ill.

D. C. Jackson, Professor Electrical Engineering, Massachusetts Institute of Technology,
Boston, Mass.

Joseph B. McCall, President,
Philadelphia Electric Company,
Philadelphia, Pa.

Capt. William E. McKay, Vice-President,
New England Gas & Coke Company,
Boston, Mass.

Herbert A. Wagner, President,
Consolidated Gas, Electric Light and Power Company,
Baltimore, Md.

S. S. Wyer, Consulting Engineer,
Natural Gas Industry,
Columbus, Ohio.

George W. Elliott, Secretary of Committee,
Washington, D. C.

The Committee was subsequently increased by the addition of Messrs. Henry G. Bradlee, of Stone & Webster, Boston, Mass., and Joseph F. Guffey, President of the Natural Gas Association of America. Mr. D. C. Jackson and Mr. S. S. Wyer later resigned, Colonel Jackson taking up overseas service and Mr. Wyer entering another branch of Government work.

An office was immediately opened in Washington and the important place the Committee was to fill and the great necessity for its existence were promptly recognized. To recite the activities of the National Committee on Gas and Electric Service is to tell of the patriotism shown and the loyal service that, through its guidance and direction, was rendered by the utilities companies throughout the country. The men of the gas and electric companies formed an industrial army which contributed its full share toward winning the war.

From these industries in which were engaged many men of special technical training, accustomed to the efficient handling of large problems of construction and operation, large numbers were at once drawn for special war service and many others enlisted in the Army or the Navy at the first call of their country. Thus, one of the first duties for the Committee on Gas and Electric Service to perform was to make a classification of the employees of the several companies into three groups—indicating the degree in which their continuance in various positions was necessary—non-essential, desirable, and imperative. Under these classifications the men came into their proper relation with their respective draft boards when they appeared before them. The question of having these men, whose natural spirit would have led them to enlist, but who were more necessary to their country where already engaged, placed in the service and assigned to special duty in their existing positions, was taken up and urged.

Another important and immediate problem for this Committee was found in the question of the continued supply of coal for the gas and electric plants generally and of oil for those gas companies making water gas. This involved the two elements of production and supply and of transportation. The situation with respect to the supply of these raw materials had already become grave. With a reduced production, consigned shipments were diverted or delayed and frequently confiscated by the transportation companies for their own use. A number of companies, in attempting to solve this problem, had purchased coal mines or oil wells, but could not in all cases be assured of bringing the coal or oil produced to the place where it was to be used. Through the appointment of the Secretary of the Committee as a member of the Peabody Committee on Coal Production and later through the appointment of technical advisers in the office of the Fuel Administration, close relations with these bodies were established and hundreds of cases were frequently handled in a single day where only the prompt delivery of coal prevented the failure of the supply of gas and electricity at local points through the shutting down of plants, which otherwise would have been inevitable.

A record was obtained as to the fuel supply of all companies, giving the kind and quantity used per annum, the water or rail connections over which received, and a monthly statement of fuel contracted for, the amounts received and consumed. With this record at hand, it became possible to deal promptly with all difficulties of supply, whether due to shipping, transportation delays or other causes, and in most cases it was possible to afford prompt relief.

With the approach of winter, when the general question of coal supply became so all-important, and priority of shipments was established, the Fuel Administration was induced to give preference to public utilities, these being placed fourth on the list and only preceded by, first—railroads; second—government, the Army and Navy; third—domestic consumers.

Very valuable work was done in connection with the making of contracts for the supply of gas and electricity from nearby companies to the several cantonments established in various parts of the country, and engineers drawn from different companies were supplied to supervise the plans and later, the installations made. In this way, the saving of a large amount of both time and money was effected as against the first plan of the Government to provide isolated plants for service at these points.

A survey was made of all gas companies in the country for the purpose of increasing the amount of toluol produced through the installation of plants for the extraction of this by-product for use in the manufacture of high explosives. After a time, aided by an appeal from Federal authorities, investigations were made as to the possibility of still further increasing the production of toluol by reducing the heat units of the gas supplied from those previously demanded by local franchise requirements. It was quite clearly demonstrated in the investigation conducted that perfect satisfaction had been given in the State of Massachusetts by a gas with a heating value of 528 B.t.u. Rochester, Toronto and other cities showed about the same results and Federal authorities were considering the issuance of an order making 528 B.t.u., the standard when the war came suddenly to an end.

With the progress of the war, and as a result of constantly changing conditions brought about by various causes, new problems continually developed. Shortage of male labor made it necessary to study where and to what extent women could be employed in the different departments of the companies' activities, and many positions, not only in the office but in the operating departments as well, where only men had been employed, were ably filled by women.

Reserve capacity in generating equipment came to be unknown and with all plants running fully loaded, new apparatus, though perhaps ordered long in advance by one company, had to be diverted to another plant where even greater need for it existed. In some cases equipment was removed from one plant to another or an exchange effected, for the general good, and large turbines, ordered and urgently needed for central station use, had to be released for installation at the powder and nitrogen fixation plants built by the Government.

The wide adoption of a plan for the interconnection of distribution systems of companies occupying adjacent territories provided added security for continuous supply of power in case of malicious interference of enemy sympathizers, or by reason of a sudden demand on one system beyond the limit of a permissible overload.

Additional sources of power were sought and a study was made of conditions at Niagara Falls, besides a general survey of existing hydro-electric developments that might be enlarged and of all standby steam stations which might be called into maximum use upon being provided merely with a full supply of necessary fuel, with a view to establishing the manufacture of war material in the localities where such additional power might be available.

It became necessary to have advance information of the demands to be made on the local gas and electric plants by a projected manufacturing plant to which it might not be possible to supply service. At certain points, notably at Pittsburgh and in New Jersey, the demands for service became so great that only partial time service could be rendered, and the Committee was called upon to have an investigation made to learn what proportion of the service rendered in these and other localities was for industries essential to the conduct of the war and how much was for so-called non-essential industries, service to which might properly be diminished or entirely withdrawn.

On this line and as a result of the general need for conservation of fuel, increased by the extreme weather conditions during the winter of 1917 and 1918, it was arranged that current produced more efficiently by the larger central stations be supplied to many isolated electric plants and to a number of municipal plants, thus reducing the total consumption of coal at such points.

Following a survey of the sign and display lighting of the country, this form of illumination was suspended under the "Lightless Nights" order. Though this measure as viewed by the general public, was expected to result in a large saving of coal, in reality the saving amounted to but very little. Yet, as the example was a good one and the psychological effect on the public tended to encourage the saving of coal by domestic users, the large attendant loss of revenue was uncomplainingly borne by the companies, as part of their patriotic duty.

As a further conservation measure, the United States Fuel Administration desired to dispense as far as possible with the use of inefficient electric lamps. A program for bringing this about was formulated by the Administration in cooperation with a committee under the chairmanship of the Chairman of the National Committee on Gas and Electric Service. The personnel of this committee included representatives of all the lamp manufacturers of the country. As a consequence of requests issued by the Fuel Administration in carrying out this program, supported by the loyal efforts of the lamp manufacturers and of the central station companies, the manufacture of the inefficient Gem lamp was discontinued and the use of carbon lamps notably diminished. In the course of the campaign for the elimination of inefficient lamps, member companies by advertising and direct appeal to customers, have developed a sentiment in favor of the use of the more efficient tungsten lamp.

A need for conserving natural gas appeared with the extreme cold weather, a condition which reduces the supply. Therefore substitute fuel had to be found for those consumers of natural gas who had to be deprived of it in order that the supply might be continued to the large manufacturers of war materials and the output of their plants maintained and not diminished by a shortage or delayed through the necessity of installing other equipment for the utilization of another form of fuel.

Recognition of the importance of the utilities companies and of the value of the special services rendered by the men supplied from their ranks brought calls from various departments, which were answered by the appointing of trained men for many kinds of services.

To lessen the danger from lurking submarines to our ships transporting troops and munitions overseas, experts in combustion were assigned to war vessels making a special coastwise trip, to instruct in proper methods of firing with anthracite coal on existing types of grates with the absence of smoke. It has been manifestly impossible to record the performance of this service in any partial reports of the Committee previously rendered.

Trained auditors from the utilities' accounting departments were furnished to the Army for service in the Quartermaster's Department, upon its request.

A cooperating committee on War Service, organized by the Illuminating Engineering Society, has in several instances served various departments and bureaus of the Government through this Committee in the preparation of lighting designs and in the preparation of publicity material in the lighting field.

To the items which have been enumerated must be added the active support given in the campaigns for the sale of Liberty Bonds and of War Savings Stamps, as well as to the drives for the Red Cross and other War Relief activities. In spite of reduced forces, with men and equipment strained to the utmost to give the greatest amount of service, the gas and electric companies of this country responded freely to all these calls made upon them. Not only did the companies and their employees generously subscribe for Bonds and War Savings Stamps and for War Relief, but the officers and employees gave freely of their time and energies in promoting and furthering the campaigns waged in their several localities.

Following the signing of the armistice and with the subsequent curtailment of all war activities, the necessity for maintaining an office in Washington was removed, and, accordingly, the office there of the National Committee on Gas and Electric

Service was closed and its headquarters transferred to New York, though the services of the Committee remained and continue available to the Government, should they be desired.

When the Committee thus ceased its active existence in Washington and gave up its labors there, it was done with a feeling of pride in the record of achievement and of service that had been rendered by the patriotic forces it represented. The unselfish and whole-hearted response given to all requests made by the Committee to the utilities companies and their employees was in itself an inspiration and clearly indicated the morale and strength of the able men entrusted with the safe conduct of the affairs of the utilities in rendering their important service to the country.

Submitted for the Committee,
John W. Lieb,
Chairman.

Mr. Edgar: Mr. President, Ladies and Gentlemen: I think that report is entirely too modest. I think it reflects the modesty of the Chairman. It was my good fortune to be closely identified with this work and to visit Washington many times, and I do not think that anyone ever did as good work for any industry, or for any government, as Mr. Lieb and Mr. Elliott did as representing this Committee. (Applause.)

I wish I had time to read you a number of letters received from the various Departments, Secretary Baker, Secretary Daniels, and other officials in Washington, expressing their deep appreciation of this work. It is hard to overestimate the time and the intelligent effort that these gentlemen gave to this work. I do not think the reading of the report itself—and I have not read it, by the way, because it came to me only today—I do not believe the reading of the report itself will give any insight into the tremendous amount of work done. I think one statement, perhaps, emphasizes it more than any other, and that is that there were very many days in which hundreds of cases of complaints about the shortage of coal were handled each day, and in practically every case a remedy was found. I think it became so much of a routine work that even Mr. Lieb and Mr. Elliott themselves did not appreciate what they were accomplishing, and

I want to add my word to what has been said in the report in an endeavor to impress upon you the tremendous value of the work done by this Committee. (Applause.)

Mr. Freeman: There is a matter which I would like to bring before the Convention before adjournment. Mr. Edgar, in presenting the report of Mr. Lieb's committee referred to the modesty of Mr. Lieb, and I think the modesty of Mr. Edgar as a member of that committee prevented him from offering a resolution which I think would be fitting at this time.

I believe, in the first place, we want to express our appreciation to the Committee in a formal way, for the splendid service it has rendered, and also that it is desired that every member of the Association shall receive a copy of this report in full so that the members can appreciate the very valuable work which has been done by this Committee.

I simply wish, Mr. Chairman, to move that the report of the Committee, as submitted by Mr. Edgar this evening, be printed for distribution to the membership, and the Committee be discharged with an expression of very sincere appreciation of the value of the service rendered.

Mr. Edgar: I would like to make one amendment—Mr. Lieb suggested that the Committee be allowed to continue.

Mr. Freeman: I will be glad to eliminate that feature of the motion.

(The Motion was duly put to vote, and carried.)

The President: The meeting will now stand adjourned.

THIRD GENERAL AND EXECUTIVE SESSION

WEDNESDAY, MAY 21, 1919

President Wells called the meeting to order at 10:10 A.M.

The President: Our first business is the Report of the Treasurer, Mr. Frank W. Smith, of New York City.

Mr. Smith: In March of last year the Executive Committee authorized that the financial operations of the Association be changed so as to synchronize with the fiscal year ending June 30. I will, therefore, at this time present only a summary of the operations covering the first ten months of the fiscal year, or from July 1, 1918 to April 30, 1919. In the printed proceedings of this Convention will appear a full and complete financial statement covering the operations for the full fiscal year, or twelve months ending June 30, 1919.

The Executive Committee authorized also that the financial operations be carried on hereafter under a budget system during the present administration.

A summary of the operations for the ten months ending April 30 is as follows:

Cash on hand June 30, including amount in checking account, amount on time certificate and deposit, and in office petty cash	$78,586.69	
Receipts for the 10 months, including fixed and percentage dues, income from sale of publications, dividends from investment, and other items	166,966.12	
Total receipts		$245,552.81
Disbursements for the period		151,312.25
Of this amount, $18,642.18 was applicable to the previous year's administration, and $132,670.07 to the current year's operations.		
Cash funds available, April 30, 1919, as per general ledger		$94,240.56

It is interesting to state that the receipts up to April 30

NATIONAL ELECTRIC LIGHT ASSOCIATION
Income Account
year ending June 30/19.
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EXPENSES

Running Expenses		
Salaries & Wages	45,951.92	
Rent	10,660.23	
Expressage & Parcel Post	435.50	
Postage, Telegrams & Telephones	2,989.38	
Printing & Stationery	1,687.85	
Bulletins	10,569.93	
Publications	14,596.10	
Rebates to Sections	13,260.50	
Committee Expenses	1,713.85	
Uncollectible Publication Bills	13.10	
Uncollectible Dues	5,403.22	
Geographic Section Expenses	2,000.00	
National Com.on Gas & Elec. Serv.	9,406.60	
Expenses of Counsel	2,070.58	
Miscellaneous Running Expenses	5,270.49	
Depreciation	779.64	126,808.89
Convention Expenses		
Preliminary Papers	5,692.46	
Proceedings	8,418.92	
Entertainment	4,552.06	
Miscellaneous Running Exp.	6,336.56	25,000.00
National Special Section Expenses		
Commercial Section Expenses	4,637.78	
Elec. Vehicle Section Expenses	691.87	5,329.65
Surplus for the year ending June 30/19		24,845.35
		181,983.89

REVENUES

Revenue from Fixed Dues		
Class A Members	18,182.50	
" B "	36,173.75	
" C "	436.25	
" D "	15,275.00	
" E "	4,179.25	
Foreign "	820.00	75,066.75
Miscellaneous Revenues		
Sale of Publications	18,507.10	
Interest Revenue	4,251.84	
Dividend Revenue	1,288.00	
Accounts Payable Cash disc.	359.23	
Other Revenue	68.57	24,474.74
Revenue Applicable to Convention Expenses		
Percentage Dues	77,851.40	
Registration Fees	2,691.00	
Advertising	1,650.00	
Miscellaneous Revenues	250.00	82,442.40
		181,983.89

NATIONAL ELECTRIC LIGHT ASSOCIATION

Balance Sheet

as at June 30, 1919

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ASSETS

Furniture & Fixtures (Less Depreciation)		2,771.93
Inventory		16,134.71
Investment in Securities		74,313.75
Liberty Bonds for a/c of Employees		3,900.00
Cash Funds		
On deposit with Bankers Trust Co. checking a/c	15,259.20	
On deposit with Bankers Trust Co. interest a/c	60,000.00	
In Office for petty disbursements	500.00	75,759.20
Accounts Receivable		
Interest Receivable	715.35	
Fixed Dues "	25,842.50	
" " " Can.Elec.Assn.	35.00	
Publ.& Misc.Sales Bills Rec.	7,951.88	34,544.73
Prepayments		625.00
		208,049.32

LIABILITIES

Accounts Payable		
Sundry Creditors	6,255.22	
Prepaid dues	74.00	
Unlocated Receipts	1,122.03	
Accrued Expenses	5,389.34	12,840.59
Employees Liberty Bond Payments		1,510.00
Thomson Scholarship Fund		479.60
Accrued Dues (6 mos.ending 12/31/19)		77,454.98
Total Liabilities		92,285.17
Reserve & Surplus		
Reserve to provide for Investment in Securities	74,313.75	
Surplus as at June 30/19	41,450.40	115,764.15
		208,049.32

are in excess of the receipts for the corresponding period of last year, by more than $25,000. The accounts receivable and dues receivable are in very good shape.

The outstanding dues and accounts receivable at April 30 amounted to $38,310.50, of which about $9,000 was for the year 1918, $7,000 of which is represented by dues of class B members. Probably all of that amount will have to be charged off, due to the suspension of members' dues, etc., during the period of the war.

An audit from Mr. Frederick Smith as to the cash accounts and securities owned and in the deposit vault of the Bankers Trust Company is given herewith.

August 11, 1919.

NATIONAL ELECTRIC LIGHT ASSOCIATION
CERTIFICATE OF EXAMINATION

I have examined the books and accounts of The National Electric Light Association for the Administrative Year ended June 30, 1919. During the course of my examination, I have verified the following:

> The Balance Sheet is in accordance with the General Ledger and, in my opinion, truly sets forth the financial condition of the Association as at June 30, 1919.
>
> Cash in Bank as shown by Balance Sheet, with Bank Statement of the Bankers Trust Company.
>
> Receipts as shown in Cash Book were all deposited in Bank.
>
> Disbursements, and the various records covering the same, are supported by vouchers duly approved.
>
> Petty Cash Disbursements, and Petty Cash in the hands of the Chief of the Bureau of Accounts.
>
> Securities owned, and United States Government Liberty Bonds purchased for the account of Staff at Headquarters, in the vault of the Astor Safe Deposit Company.

(Signed) FREDERICK SMITH,
Auditor.

I might add that the expenditures during the ten months have been well within the appropriations so far authorized.

NATIONAL ELECTRIC LIGHT ASSOCIATION

Profit and Loss Account

Year Ended June 30, 1919

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Balance to the credit of account June 30, 1918		47.400.95
Preceding years deficiencies		
National Committee Gas & Elec.Service	5,724.61	
Wiring Committee-	150.00	
Technical Hydro Electric Section-	1,109.05	
Convention Expenses	3,746.05	
Apparatus Committee	206.15	
Phila. Electric Vehicle Sec.	1.22	
Miscellaneous Debits	47.50	
	10,984.58	
Miscelleneous "P & L" items	388.68	10,595.90
Corrected balance to the credit of account June 30,1918-		36,805.05
Surplus for the year transferred from "Income Account"		24,845.35
		61,650.40
Investment in U.S.Government Liberty Bonds		20,200.00
Balance to the credit of account June 30, 1919		41,450.40

The President: You have heard the report of the Treasurer. What is your pleasure?

(Moved, seconded and carried that the Treasurer's report be accepted and placed on file.)

The President: The next order of business is the election of the Nominating Committee.

(The following names were placed in nomination and duly seconded: Louis A. Ferguson, Chairman, H. L. Doherty, C. L. Edgar, W. W. Freeman and J. B. McCall.)

(On motion, duly seconded and carried, the nominations were closed and the Secretary was directed to cast one ballot for the gentlemen named.)

(Secretary reported that he had cast one ballot for the nominees.)

The President: The Nominating Committee will report at the Thursday morning session.

We will now have the report of the Membership Committee, which will be submitted by Mr. Walter Neumuller, of New York City.

REPORT OF THE MEMBERSHIP COMMITTEE

The decrease in membership which began soon after the country entered the war, has continued during the last year. It is gratifying to note, however, that whereas the net loss in all classes a year ago amounted to 23 per cent, the decrease last year was less than 15 per cent. A summary of the membership as of April 30, 1919, showing also the gains and losses in the several classes during the period May 31, 1918, to April 30, 1919 (eleven months), follows:

Class	Membership as of May 31, 1918	New Members	Resignations	Changes During Period (Loss)	Mem'ship as of April 30, 1919
A	1084	32	82	50	1034
B	9433	1348	2995	1647	7786
C	93	6	8	2	91
D	249	37	41	4	245
E	944	139	193	54	890
Foreign	44	2	5	3	41
	11847	1564	3324	1760	10087

Decrease in membership since May 31, 1918—14.8 per cent.

It will be seen that nearly 94 per cent of this shrinkage occurred in Class B. This loss, though substantial, was considerably less than in the preceding year, as the following figures will show:

COMPARATIVE STATEMENT OF CHANGES IN CLASS "B" MEMBERSHIP

	11 months ended May 31, 1918	11 months ended Apr. 30, 1919
New members	1219	1348
Resignations	4484	2995
Net change (loss)..........	3265	(loss) 1647
Gain in new members over 1918.................		129
Decrease in number of resignations..............		1489
Decrease in net loss...........................		1618

That a considerable reduction in this class should have occurred is not surprising to those who have been in close touch with the situation. It was but natural that the general curtailment of Association activities during the war period, the abnormally great turnover in company personnel and the general diverting of attention of everyone from normal activities to war duties, should have been followed by many defections from our membership. The largest single factor, however, is to be found undoubtedly in the static condition of most of our Company Sections, through which in the past the Class B membership has been largely built up. A census taken by the Committee on Company Sections last January showed that but nineteen out of a total of seventy-three Sections were pursuing activities of any kind whatsoever, while many of the others had entirely disbanded. The causes underlying this condition have been carefully analyzed by the Committee on Company Sections and will be brought to your attention at this Convention.

At its meeting in January, your Committee gave careful consideration and study to a plan presented by Mr. Frank A. Birch, chairman of the Committee on Company Sections, involving the establishing of a new form of limited membership within Company Sections.

It was pointed out that in the past, competitive campaigns for new members had resulted in bringing into the Association many who were not, for the time being at least, in a position to profit from such membership and their interest therefore was of a temporary nature. Mr. Birch's plan contemplated arousing the interest of such central station employees through membership in the local Company Sections in whose activities they will be encouraged to undertake local participation as a first step toward a greater interest in matters of national practice and importance, leading to their taking out N. E. L. A. membership.

The Membership Committee is in accord with this plan and has given its endorsement to the proposed amendment to the Constitution providing for a form of limited membership, which will be submitted to you for action at this Convention.

The losses in Class A are confined almost entirely to companies operating in the smaller cities. Some were lost through consolidations, and, while the Association will be deprived of the revenue represented by the fixed dues of these companies, there should be no corresponding loss in percentage dues.

Co-incident with the announcement of this Convention your Committee began a systematic mail canvass of all non-member central station companies. In direct response to about 350 letters sent out during April, ten applications for membership have already been received, and it is not at all improbable that by the time the entire list of 1900 companies has been canvassed, a substantial increase will have been recorded. In this work the Committee has enlisted the active cooperation of the Geographic Sections, through which the canvass will be followed up locally.

With the return of normal activities on the part of the Association, the Geographic Sections and the Company Sections, your Committee feels that the turning point has been reached and is confident that the membership will from now on, show an increase.

WALTER NEUMULLER, *Chairman*
DOUGLASS BURNETT
J E DAVIDSON
E A EDKINS
W E LONG
I E MOULTROP

The President: If there is no objection, this report will take the usual course. (No response.) So ordered.

The next paper is the Report of the Committee on Company Sections, which will be presented by Mr. F. A. Birch, of the Philadelphia Electric Company. (Applause.)

REPORT OF COMMITTEE ON COMPANY SECTIONS

America's entry into the world war affected Company Sections probably to a greater extent than it did any other single department of the Association's work.

These organizations are made up largely of the younger men in central station organizations, and as it was the Country's young manhood which was called to active military service, the result was that the very foundations were pulled from under nearly every Company Section in the Association. A majority of them disbanded; a smaller number temporarily suspended; while a few maintained their customary program of meetings, although, of necessity, somewhat abridged.

During the period between the 1917 Convention and the signing of the armistice, the work of this Committee was practically at a standstill. Not a single new Company Section was formed. It seemed impossible to stop the exodus which was swiftly depleting the Sections of their officers and active workers. The few larger Sections which, by reason of their varied membership, were able to maintain their activities, were content with being able to hold their meetings, and did not attempt any new work.

Early in December, 1918, when peace seemed assured and the Association's Executive Committee was considering the advisability of resuming normal activities, President Wells summoned the Chairman of the Membership Committee and the Chairman of this Committee for a conference, as the work of the two Committees is naturally very closely related. Plans for reconstruction were decided upon and meetings of both Committees were called in January, 1919.

For the purpose of securing a sort of inventory of existing conditions in Company Sections, requests for reports covering the calendar year 1918 were sent out by this Committee early in January, 1919. These requests were sent not only to Sections known still to be active, but also to all other Class A member companies to which permission to form a Company Section had at any time been given. Each request was accompanied by a

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Manuscript of this report was received April twenty-second.

printed blank form, entitled "Annual Report of Company Section," upon which the report was to be made. A total of seventy-three of these requests was sent out, and a reply has been received from every one. These replies naturally divide themselves into three general classes as follows:

Class A	Active Sections holding regular meetings 4509 members	19
Class B	Former Sections willing to reorganize	17
Class C	Former Sections dormant or disbanded	37

So far as the Company Sections are concerned, an idea of the havoc wrought by the war may be gained by comparing these figures with those of the pre-war period. At the time of the Convention of 1917, two years ago, the Association had sixty-four active Company Sections, with a total of approximately ten thousand Class B members. It is obvious that we are nearly back to the starting point in the Company Section movement. The personnel of central station organizations has undergone a marked change during the last two years, and we must therefore address our efforts to an entirely different aggregation of individuals in each company. In promulgating the Company Section idea and in advocating this form of employees' organization, we cannot begin where we left off when America entered the war, but we must go still further back and convert the large number of new employees to the merits of our plan. With but nineteen active Sections, and each of these suffering from serious inroads upon its membership, reconstructive work of the most practical kind is imperative.

A meeting of the Committee, the first in fifteen months, was held in New York on January 31, 1919. The conditions revealed by the reports from the Company Sections were carefully reviewed and a program of reconstruction was decided upon. The intervening three months have been too short a period for any substantial realization of our hopes, but there are many indications that we are working along the right lines.

It long has been evident to this Committee that the continued existence and development of the Sections must of necessity be predicated on some modification of the National Constitution as it affects membership in Company Sections. The wording of Article XIV, Section 2, is unequivocal: it says;

> "No person not a member of the National Electric Light Association shall be eligible to membership in a Company Section of the National Electric Light Association."

The results of this law have been one or the other of the following:

1. Restricted participation in the benefits of a Company Section. Only those who can afford to pay the Class B dues, $5 per year, may become lawful members. In this there are a number of disadvantages.
   - (a) Nearly all of the Sections are financed by the Class A member companies to which they are attached. Since the companies really provide the benefits, company officials feel, as a rule, that these should be made available to all of the employees and not restricted to those who are members of the Association.
   - (b) Many employees who might be helped in their duties by attendance at Section meetings are, for lack of development or because of inexperience, not yet qualified for Class B membership, and are therefore not justified in making the $5.00 expenditure.
   - (c) As a result, these officials direct that all employees be permitted to participate in the benefits of the Section, irrespective of whether they be Class B members of the National Association or not. When this condition prevails, there is left but little on which to base a solicitation for Class B membership. Locally, they are on an equal footing: their status is the same. Nationally, the Class B member receives each year eleven issues of the BULLETIN and a copy of some division of the Convention *Proceedings*—usually several months after the Convention has adjourned. When first he becomes a member, he also receives a handbook—his choice of one out of a possible four—which may or may not bear upon his Company duties. It is obvious that among the employees of a central station, there are a large number upon whose work none of the four handbooks has any bearing whatever. Since all pay $5.00, however, and this entitles

each to a handbook, it frequently happens that rather humorous selections are made. For instance, in one case a company's medical director chose the "Classification of Accounts," and the chef selected the handbook on "Overhead Line Construction."

2. Sections, the operation of which is in direct variance with the Constitution. These are those wherein provision is made for an associate form of membership, eligibility to which is not contingent upon any class of membership in the National Association. There are disadvantages in this arrangement also:
    (a) There seems to be no uniformity regarding the status of these associate members. In some Sections they vote, hold office and have all the other privileges of Class B members. The injustice in this situation has already been discussed.
    (b) Since the National Constitution does not countenance this class of membership, these Sections are, in a sense, outlaws—Bolsheviks. From this point it is but a step to the formation of a local employees' club and divorcement from the National Electric Light Association.

When conferring with President Wells early in December, this situation, together with the Committee's suggested remedy, was brought to his attention. Complying with his instructions, the Committee sent him a brief write-up on the subject. This was presented to the Public Policy Committee at its December meeting and, after discussion, a sub-committee, consisting of Mr. H. L. Doherty, Mr. H. A. Wagner and Mr. W. F. Wells, was appointed to confer with the Committee on Company Sections. Through the courtesy of Mr. Walter Neumuller, Chairman of the Membership Committee, this conference was effected at the January meeting of that Committee. Mr. Doherty was present and the subject was fully discussed. This Committee was directed to prepare a suitable amendment to the constitution for presentation to the Public Policy Committee and the Executive Committee. This amendment was prepared and has now been approved by the Public Policy Committee, the Committee on Constitution, the Membership Committee and the National Executive Committee. It will come up at this Convention for final action, and is as follows:

ARTICLE XIV—COMPANY SECTIONS

That Section 1 be amended to read as follows:

> *Section 1.*—Upon the application to it by any Class A member, having in its employ not less than ten Class B members, the Executive Committee shall authorize the organization of any or all of the officers and employees of said Class A member into a Company Section of the National Electric Light Association, the Officers, Executive Committee and Committee Chairmen of which shall be elected from the Class B membership.

That Section 2 be amended to read as follows:

> *Section 2.*—A Company Section may include as Limited Members those employees of Class A members who desire to participate in the local Section's activities but who are not yet qualified for Class B membership. The dues from such Limited Members shall go into the local Section treasury.

In advocating this amendment we have two objects:

1. To afford a legitimate standing for those employees of central stations who cannot or will not spend $5.00 to become Class B members of the National Association.
2. To dignify Class B membership and make it somewhat more exclusive. At present, this Class is not attractive. No qualifications except a $5.00 bill are necessary. Associated in this Class are office boys, all classes of clerks, restaurant chefs, janitors, medical examiners, company officials, and almost every other form of labor that goes to make up a central station's operating and executive force.

What we most need, so far as the Association in its relation to the employees of Class A members is concerned, is a large number of active, healthy Company Sections. Until now, our endeavor has been to build up Company Sections by accretions to the Class B membership. We believe that the logical procedure is to build up Class B through the Company Sections—

first the limited member, then graduate him into a Class B member.

For many years Class B has been cheapened by wholesale dragnet methods of soliciting members, with the principal object of having a very large number in the Association. It is obvious that forced membership is no moral strength to any organization. Make it an honor to be a Class B member by giving the member the preferred standing advocated in the proposed amendment, and the time is not far distant when membership in this class will be a thing sought by an employee, instead of something which he is urged—sometimes coerced—to take. If the amendment is adopted, we intend to follow this thought through to the point of having each Section amend its constitution so as to provide in the Section the same preferred standing for Class B which we are advocating in the National Association.

The adoption of the proposed amendment will not effect so radical a change in Class B as might, on first thought, be supposed. There is in the minds of many a mistaken impression that in the absence of any change in the Constitution, Class B membership will remain at a uniform strength from year to year. The reports of the Membership Committee, however, prove that this is not the case. At the time of the 1917 Convention, there were 12,278 Class B members; 1918, 9013; while on April 1, 1919, there were but 7514. The reduction in members is, of course, largely due to the war, but we believe that a large number of Class B members have used the war as an excuse to do what they really desired to do for some time, namely, discontinue their membership.

A fear is sometimes expressed regarding the reduction in income which a possible decrease in Class B would effect. A cost study made at headquarters some time ago, revealed the fact that the cost to the Association of a Class B member is approximately $10.00—twice the amount which the Association receives as dues. In view of this, it is difficult to understand how a reduction in numbers could embarrass the Association financially.

During the last five years this Committee has made an intimate study and investigation of this question of membership in Company Sections. We fear that it has been the endeavor largely to increase the number of Class B members as an asset of the Association, rather than to afford such means for development and advancement as would enable all of the employees of a central station to equip themselves for greater responsibilities. We believe that membership in Company Sections should be based on such terms and conditions as will afford the most liberal means of advancement to each of the employees of Class A members, without regard to the number of Class B members in the National Association. So far as it affects this class of membership, the Association should be maintained for the purpose of aiding the Company Sections to develop and multiply and in every legitimate manner to assist them in becoming valuable and practical allies to our Class A company members. We are in error when we assume that the Class B membership should be fostered and promoted primarily for the purpose of buttressing the National Association, either financially or otherwise.

For several years there has been a marked tendency among central stations to organize employees' clubs instead of Company Sections of the N.E.L.A. In a few instances, Sections already in existence have been superseded and absorbed by local employees' clubs. Organizations of employees in central stations are essential. They have always existed in various forms and undoubtedly will continue to exist. There are many such organizations today which are not identified with the National Association because of the restrictions regarding Company Section membership now contained in the Constitution.

Organizations of employees will continue. The question for us to decide is whether such organizations should be in the form of company clubs or other local welfare organizations, or through the instrumentality of a Company Section of the National Electric Light Association.

This Committee does not believe that the adoption of the proposed amendment will be a panacea for all ills. It will not, in fact, permit any really new thing. Many of the larger Sections already have a second class of membership, which, however, is contrary to the Constitution. But we do believe that it will greatly aid us in our endeavor to keep employees' organizations within the Association and largely increase the number of those who may benefit by Section membership. We do not believe it will result in any considerable reduction in the number of Class B members. Those who remain will be there because they want to be—the only healthy basis for any class of membership. It will be a distinction and an honor to be a Class B member of the National Electric Light Association; and it is very doubtful if we can truthfully say so much at present.

The Reconstruction Program

The Committee is engaged upon a number of plans which, it is believed, will materially assist all of the Sections—those still alive, again to attain their maximum efficiency; those willing to reorganize, to accomplish that fact at an early date; those which have disbanded, to reorganize and again perform their natural function in central station organizations.

Sub-Committee on Educational Work

This Committee has provided itself with approved plans for the education, both elementary and advanced, vocational and academic, of the members of Company Sections. It will gladly submit courses and programs, and will lay out a system of educational work for any Section applying.

Sub-Committee on Organization of New Sections

This Committee will be glad to correspond with any Class A member which desires to organize a Section. It will outline the initial steps to be taken, will suggest forms of meetings and prepare programs of speakers. If desired, it will delegate a member of the Committee to visit the inquiring company, for the purpose of personally discussing organization plans, and will also have this member attend the opening meeting, if the Section so requests.

Sub-Committee on Section Visits

This Sub-Committee is arranging a program of great detail, which will insure a personal visit to one or more meetings of every Section in the Association by members of the Committee during the Association year. The object is to make the Sections realize that the National Association has a sincere and intimate interest in all of them, and a live interest in their current activities, their development and their advancement.

SUB-COMMITTEE ON PUBLICATION

This Sub-Committee will keep in close touch with Section Publication committees and endeavor to keep fully posted on the work being done in all Sections. Through this channel it will also endeavor to assist in supplying live and interesting matter for that section of the Bulletin allotted to Company Section work.

SUB-COMMITTEE ON SPEAKERS AND LECTURES

This Sub-Committee is at work on a proposal made by Mr. H. L. Doherty, that manufacturers of electrical machinery, devices and appliances, have members of their organizations prepare and deliver lectures upon the manufacture and utilization of their product. It will also maintain a file of available speakers for Sections, in order to assist chairmen and others in the preparation of yearly programs, and also for those emergencies wherein Sections are suddenly deprived of a promised speaker.

With the approval of the Executive Committee, there is in preparation an engraved charter which will hereafter be presented to authorized Sections upon completion of their organization. Charters also will be presented to Sections already in existence, provided they are endeavoring to maintain or restore their accustomed activities. These charters are engraved on heavy parchment and are suitable for framing or other permanent preservation. Heretofore, when a Company Section has been authorized by the Executive Committee, notification of that fact has been sent the Company, in the form of an ordinary letter from the Secretary of the Association. This is usually buried in a letter file and in many instances is lost or destroyed. It is believed that the possession of one of these charters will tend to promote a more intimate relation between the Sections and the Association. Undoubtedly they will be appropriately framed and cherished among the Sections' archives.

This is the reconstruction period. Nowhere is reconstruction more needed than in Company Section work. These organizations have suffered terribly from the war. We intend, however, to nurse them back to life and health. Every Section, dead or alive, which may have existed at any time in the last ten years is receiving our attention. We have a systematic plan of resuscitation and have for the last three or four months been hard at work upon it. One new Section was formed early this year, the Wisconsin Power, Light and Heat Company Section. Several Sections have reorganized and are again doing good reconstructive work. Those that have signified a willingness to reorganize are all being assisted to that end, and ere another Convention rolls around, we confidently expect to be able to report all the former Sections reorganized, active and healthy and a number of new ones in addition.

The Committee takes this opportunity to express its deep and sincere appreciation of the counsel, advice and cordial cooperation of Mr. Walter Neumuller, member of the Executive Committee and Chairman of the Membership Committee. He has given largely of his time, sometimes at great personal inconvenience, and has materially aided the Committee in formulating the plans outlined in the foregoing report.

Respectfully submitted,
Frank A Birch, *Chairman*

F J Arnold
Henry Bostwick
D C Bruce
W G Claytor
G B Cornell, Jr
F A Coupal
C E Groesbeck
F R Healey
J C Hobbs
E W Kent
Ralph T Schuettge
Joseph B Seaman
Charles E White
C R Young

The President: This is one of our most important subjects for the coming year, and I would like to have a very full and frank discussion upon the Report of the Committee on Company Sections.

W. C. L. Eglin, Philadelphia: This is a subject that I have personally been much interested in for many years. The year before I was elected President of the Association Mr. Doherty suggested the amendments to the Constitution providing for Company Sections, and it was my duty and privilege to help organize a number of them. It is true that we started to organize these sections in companies which had had employees' clubs because such clubs provided some organization that was easy to transfer to a Company Section.

Since that time the movement has grown and there have been many new sections organized. Unfortunately we did not give to the details of organization of Company Sections the attention that the subject deserved.

I feel that it is here, upon the Company Sections, that the future of this Association depends. Company Sections are composed of the younger generation, who are going to carry on this important work, and the sooner we can tie these men into the thoughts, ideas, and ideals on which this Association is based, the better and stronger the whole Association will be.

I feel very strongly that our early methods and our early plans were not correct, and I am very glad indeed to hear this report today, because these men have gone into this subject very carefully, and have gathered the experiences of all of the Company Sections. I believe that this report should be sent out to every member company with a letter drawing its attention to the desirability of organizing a Company Section along the lines suggested by the Committee. I feel that in every district where the companies may be too small to organize employees' clubs or Company Sections, there should be a grouping of these companies, for the purpose of organizing a Company Section, so that this work may go on.

I know and feel certain that, if you will give this matter some thought, there is nothing which will be of greater benefit to your own organization than the immediate formation of a Company Section, if you have not one already organized.

I believe that every executive of a company should take a personal interest in the Company Section work. It is the work of the Company Section that will return him 100 per cent dividends. The Geographic Sections may return him a less amount, and this Association a still less amount, but the big, individual returns to all of us will come from our interest in the Company Sections' work. I feel rather strongly that our membership has not taken up this subject seriously enough, and has not spent enough time or energy in the development of the Company Section movement. I hope there will be very free and open discussion on this subject because I know that the Committee will want it, and will need any ideas that you can give it, which will be of advantage in the work during the coming year.

M. S. Seelman, Jr., Brooklyn, N. Y.: From considerable experience in Company Section work, I have the very strong conviction that this Company Section Committee of the Association can materially assist in the future development and activities of the Sections by aiding in the preparation of rational and sensible programs for Company Section local activities, and by assistance not only in formulating, but in carrying out these programs. I think the Committee can help more in that way than in any other way; in other words, we are now starting a period of rejuvenescence, of beginning Company Section activities over again, and we have the benefit of all the experience we have had. That experience—I believe others interested in Company Sections will bear me out—that experience has been that the programs of the meetings after a while become fixed in one of two ways—either they are composed largely of educational activities, possibly not conducted as well as they might be, and therefore degenerating into a period of an hour or two of boredom for a great many of those present, or, this feature of the Section activities failing, the meetings take the form of an evening of social entertainment. In this case they lose their character and the purpose which it was intended they should fulfill in the organization of Company Sections. If we can work out some method of handling these meetings that will be at once educational, fulfilling the functions we have in mind of bringing our young men along and making first rate central station people out of them, and at the same time interesting and entertaining them, I think the Committee will have accomplished a work well worth while. It will be doing something permanent, not temporary. I believe the Committee on Educational Activities and the Committee on Furnishing Speakers, if they will really get active in connection with local Company Section work, and get in touch with those having charge of such work, and cooperate with them, will become important adjuncts of this development of our National Association life. (Applause.)

The President: The report is still open for further discussion.

H. W. Stevens, Boston: I can heartily support what the last speaker has stated. Our Company Section has been one of those listed as dormant during the war, and recently we have tried to start it up again. Previously the method has been as stated by the last speaker; it was either a question of some sort of educational lecture, or some entertainment. We have a strong employees' club in our company, and the Company Section of the N.E.L.A. cannot compete with it in the entertainment line. The club has many more meetings than we have, and we cannot get our people to join the Section, as the dues in the club are much less than the N.E.L.A. dues. I think the Committee's suggestion of having two classes of membership may help that somewhat.

I have found if I can announce an entertainment of some kind, the meeting will be well attended; but if I announce that some member of our company is going to speak on some subject pertaining to his work in the company, the general attitude is that "he is one of our people and we don't care anyway," and they do not come. So I think this proposition of giving us outside speakers to tell something with which our people are not familiar will help.

At the last meeting we endeavored to get as large an attendance as possible, it being the first one since the armistice was signed. We offered the men free cigars, had an Army officer speak to us, and we had about 60 present.

Then I outlined an idea I had, that it was my opinion that the members in the Company Section should use their membership to help themselves. When you approach a man to join the N.E.L.A., and consequently the Company Section, he wants to know what he will get out of it for the five dollars he puts into it. I tried to make it plain that the Association itself could not tell what he would get out of it; that it was a case of every man for himself, and that the man who tried to get the most out of the Association would get it. I asked for help then on the next meeting, and so far I have one paper which will be presented.

There seems to be a great apathy among members, and if any one can offer suggestions to arouse interest I would appreciate it. (Applause.)

THE PRESIDENT: Any further discussion (No response.) Does Mr. Birch desire to sum up?

Mr. Birch: I think the only question raised was the one by the last speaker regarding apathy among Company Section members. This is a very common condition and our Committee has frequently been called upon to suggest a solution. We always advise making a Company Section a selling proposition. In order to attract and hold the attention of the members, the meetings must be made interesting. As a rule, the employees of central stations do not realize their lack of development. They are, therefore, not particularly anxious for education; consequently, we have to give it to them in capsule form. The capsule must be some sort of entertainment of a lighter nature which will attract them to the meetings. While we have them there, we must give them the real educational work which, after all, is the object of every Company Section.

In one large Section that I know of, the general monthly Section meeting is purely social and entertaining. The object is to get as many as possible to attend this meeting so as to promote acquaintanceship and good fellowship. Branches of the Section have been established for the consideration of the specific work of the various company departments. For example, there is the Engineering Department branch which discusses topics purely of an engineering character. The Meter Department branch confines its meetings strictly to subjects relating to the little instruments which register our revenue. The Commercial Department branch discusses accounting, sales and other topics; but from all of these branch meetings, social features are rigidly excluded. This arrangement has proved to be the best for conducting the activities of a Company Section.

The President: The next report on the program is the Report of the Committee on Constitution and By-Laws, which will be presented by Mr. William C. L. Eglin, of Philadelphia, Chairman.

REPORT OF THE COMMITTEE ON CONSTITUTION AND BY-LAWS

The Committee's activities during the year were limited to the two matters brought to its attention: viz., the amending of Article XIV—Company Sections; and Article XVII (Section 1) —Geographic Section Refund.

The proposed amendment to Article XIV was drawn up by the Committee on Company Sections to enable the Company Sections to have a grade of membership to be designated as "Limited Members"; *i.e.*, employees of Class A Members, who are not yet qualified for Class B membership but who desire to participate in the activities of the Company Sections.

Article XIV at present reads as follows:

> SECTION 1. Upon the application to it by any Class A member, the Executive Committee shall authorize the organization of any or all of the officers and employees of said Class A member into a Company Section of the National Electric Light Association.
>
> SECTION 2. No person not a member of the National Electric Light Association shall be eligible to membership in a Company Section of the National Electric Light Association.

As amended, this Article would read:

> SECTION 1. Upon the application to it by any Class A member, having in its employ not less than ten Class B members, the Executive Committee shall authorize the organization of any or all of the officers and employees of said Class A member into a Company Section of the National Electric Light Association, the Officers, Executive Committee and Committee Chairmen of which shall be elected from the Class B membership.
>
> SECTION 2. A Company Section may include as Limited Members those employees of Class A members who desire to participate in the local Section's activities, but who are not yet qualified for Class B membership. The dues

from such Limited Members shall go into the local Section treasury.

Prior to being submitted to the Committee, this amended Article had been carefully considered and had been endorsed by a specially appointed Sub-Committee on Limited Class B Membership and by Mr. Henry L. Doherty representing a special Sub-Committee on Company Sections, of the Public Policy Committee.

The Committee has studied this amendment both with regard to its effect on the Company Sections and with regard to its effect on the Association as a whole, and unanimously recommends its adoption.

The proposed amendment to Article XVII (Section 1) was suggested by Mr. R. H. Ballard, in order that the portion of the Class A and Class D dues to be refunded to the Geographic Sections may be left to the discretion of the Executive Committee of the Association.

Article XVII (Section 1) at present reads as follows:

> SECTION 1. Upon certification to the Treasurer of the National Electric Light Association by the executive officers of any Geographic Section stating the membership of such Section who have paid dues for the full calendar year, and upon approval of the Executive Committee, the Treasurer of the National Electric Light Association shall pay over to the proper officers of the said Section an amount not to exceed fifty (50) per cent of the *fixed* yearly dues received from all the Class A and Class D members of the Section, and an amount not to exceed fifty (50) per cent of the yearly dues received from the Class B and Class E members of the Section. The Executive Committee, however, shall limit these appropriations to any amount that it may deem advisable. The Section officers shall file a budget during January of the estimated expenses for the ensuing year for the approval of the Executive Committee, and shall also file a detailed statement of the actual expenses at the close of each year.

To amend Section 1 of this Article, it is proposed to omit the word "fixed."

The Committee has also carefully studied this amendment and unanimously recommends its adoption.

These amendments have received the approval of the Executive Committee, and in accordance with the Constitution are now submitted for the vote of the Class A members.

Respectfully submitted,

Wm C L Eglin, *Chairman*
H C Abell
W W Freeman
Frank W Frueauff
H T Sands
C G M Thomas

The President: A motion is in order for the adoption of the amendments submitted by the Committee on Constitution and By-Laws.

(Upon motion duly made and seconded, the amendments as read were separately adopted.)

The President: The Chairman appoints as the Committee on Memorials in accordance with our regular practice, Mr. T. E. Bibbins, of San Francisco, Chairman, and Mr. S. A. Sewall, our Acting Secretary.

He appoints as the Committee on Resolutions Mr. Arthur Williams, of the New York Edison Company.

The United States Geological Survey, of the Department of the Interior, has spent a lot of time recently on the subject of power supply. It has worked out a plan for inter-connection of the power stations of the large power supply companies, and has developed a plan for what might be called a river of electrical power. We are honored in having with us today Director George Otis Smith, of the Department of the Interior, United States Geological Survey, who will address us on this subject. And it gives me great pleasure to present to you at this time Director Smith. (Applause.)

PLANNING FOR POWER

By George Otis Smith

Director, United States Geological Survey

The relation of government to business is in itself a topic too large for your three-day program, and I will therefore limit myself to the simple thesis that planning for the general welfare is a proper function of government. In the long years of public experimentation with business the restriction of excessive growth has been attempted by large and bitter doses of anti-trust prosecutions, followed by prescriptions of more direct regulation, and —concluding the series, we trust—by several governmental operations under the anesthesia of war. Fortunately, however, the patient has survived each course of treatment, and while our financial and technical journals are full of interesting fever charts that graphically tell the story of the depressing reactions of the past, American industry and American business still live. Before abandoning this figurative diagnosis of the case I may add my personal conviction that Uncle Sam as a doctor has on the one hand given too much medicine and performed too many minor operations and, on the other, paid too little attention to the patient's diet and exercise. In other words, supervision of industry can and should be constructive as well as restrictive.

There has been, fortunately, some progress in our ideas of what is the true relation between government and business. Governmental cooperation with business is the next step. Industry itself is indeed cooperative and social by nature, and the bigger "big business" becomes the greater its need of socialization in the true sense.

In manufacturing, as in public service, the trend must be not toward price-lowering through competitive marketing but toward cost-lowering through competitive effort for efficiency. The operating official—the superintendent at the works—and not the sales manager may be the man who has most to do with the future success of the business. The idea that competition is productive of low prices has been over-emphasized in our laws, because public opinion has believed in that way of keeping big business under control—but average prices can not for any very long period be lower than average costs. The Government bureau, board, or commission that seeks to protect the consumer will do well to help in the organization of industry on lines that will work out lower costs. And such planning must be on a national scale. As the efficient executive of the street railway system keeps before him a map of the city or district served, on which he plots the details of growth and of future needs, so the Federal administrative officer must plan for the future with the same foresight; and planning of this type is properly a function of your Government at Washington.

These are days of "changing gears" on the big industrial machine of our country. Under the war-speed conditions we took everything on "high," regardless of either economy or safety. Now we have slowed down to "look and listen," and Business must decide what speeds are best suited for the long pull ahead. The time is therefore opportune for broad planning, and there is no more urgent need than that of a power program.

A year ago, you may recall, the war boards at Washington outlined on the industrial map of the Eastern United States an area of high pressure—a danger zone, where mills were overloaded with work and railroads were congested with freight. Fuel famine and power shortage had been threatened, and drastic action seemed necessary. Within that area half a dozen rail gateways absolutely limit traffic, so that even now, with the war stress no longer active, the internal strain still exists in the transportation and industrial system of the Boston-Washington zone. Restriction of industry was the war-time remedy proposed; electrification is the peace cure.

To tell the National Electric Light Association at its forty-second convention that electric energy is man's best servant may be too much like "carrying coals to Newcastle." However, my purpose is to sum up some of the outstanding facts in your business which ought to appeal to the general public, for whether we are public-service officials or public servants we are all American citizens interested in the public welfare. As I see it, power is the great industrial need of the day—without it the speeding up of our Nation in its recent great effort to help save the world would have been impossible. Try to think of our war-time program in terms of unaided human energy; even as it was our great transportation systems almost broke under the task. The transportation of raw materials and manufactured products even in peace times calls for herculean energy—a power demand measured by more than five million continuous horsepower. Compare, if you will, the energy of the coolie crossing the mountains of central China with his back-load of tea and the energy of the electric locomotive hauling copper ore from mine to smelter or ammunition from Bridgeport to New York, and you realize what electric power means in transportation.

In terms of cost, the best figures available indicate that motive power accounts for fully 30 per cent of the expense of operating steam railroads and for about 10 per cent of the expense on well-managed electric railways. Aside from this difference in power cost, electric energy must be credited with the greater efficiency it makes possible. A western railroad president once told me that his road, on its mountain divisions, had reached the limit of train loads because the size of the locomotive was limited by the size of fireman who could be employed. The electric engine places no such burden of toil on its operator, and electrification gives a much greater capacity to the same line of steel rails.

The power element is smaller in manufacturing than in transportation but not less important. In the making of cotton cloth about 2 per cent of the value of the product can be charged to power, while in the production of electrolytic zinc the power cost is about 12 per cent. In general, 2 per cent may be taken as a conservative figure for the power item in total manufacturing cost, and this may seem almost negligible, but the wider use of power in mills and shops has a larger effect than is measured by its own cost—the kilowatt-hour may double the product of the man-hour, and men cost more than kilowatts.

Electric power, as furnished from the large central stations, is favored by that happy economic law whereby the load factor works both ways. Lowering the cost of electric energy invites greater use, and greater and more diversified use permits lowered cost. That is no vicious circle; it is the virtuous upward curve of progress.

The future of power use is so encouraging that I dislike to pause and speak of the less attractive present. The story of wastes in our national career is not a pleasant one. American pride prefers to dwell upon those things that America does well; we have much to be proud of in our record of invention and construction and operation—indeed, the term "electrical" seems to describe something of purely American origin that has to be translated into the life of other peoples. Yet here in its birthplace and home the electrical industry is not as efficient as it should be. Your best engineers see the trouble—the growth has been so rapid that we have given too little thought to systematic development. Wonderfully well thought-out units are scattered here and there, but these are widely separated islands in a sea of poorly planned or obsolescent plants.

The net result of this lack of system is that we permit wastes which are large items on the wrong side of our national ledger. You gentlemen know far better than I the wide span between your best records in large up-to-date central stations and the results obtained in smaller and often obsolescent private plants. Measured by coal burned to the kilowatt-hour the ratio is 1 to 2 or 3, or even more. Where else do we find such opportunities to cut down the coal bill? We can see even greater savings when we consider the advantages of hitching up American rivers and American coal—they work best in double harness. I appreciate as you do the wide difference between the initial expenditures involved in the two types of plants, and I realize also that the steady stream of so-called fixed charges flows through the hydro-plant whether it operates or not, yet I believe that we are far from making full use of the water powers that lie undeveloped within easy transmission distances of our largest power markets. It is, moreover, time to count the rising costs of labor in the steam plant, where the coal miner as well as the fireman is an employee in fact, whether you see the miner's name on your payroll or not. The figures presented by the Alabama Power Company in its comparison of steam plant with hydro-plant show the ratio of men employed as 84 to 1. Conservation of human energy calls for the immediate and full development of every water power that is feasible.

In comparing the efficiency of the steam locomotive with that of the electric motor, I think of the switching engine as a self-contained power unit having the worst possible load factor. Here the difference at once translates itself into increased coal consumption, and we find one ton of coal converted at the central station into the electric energy delivered to the electric motor doing the work of four tons shoveled under the boiler of the locomotive. Even with the better load factor of the passenger locomotive, there is little room for difference of opinion when we learn that the Merchants' Limited requires only half as much coal per mile between New York and New Haven as between New Haven and Boston. Can we afford to burn two tons of coal where one will pull the load?

The Secretary of the Interior offers a power program, and his program is inspired by a vision of future needs. He regards the almost insatiable demand for power created by war industries as foreshadowing future danger of power famine in the industrial districts of the Northeast. The signing of the armistice happily averted the power crisis that otherwise we would now be facing. Now, however, a policy of preparedness for peace expansion should be adopted.

This administrative officer's recognition of the urgency is, then, in full harmony with that definition of vision quoted by a leading engineering corporation: "Experience is the only prophecy of wise men." Secretary Lane looks upon the present relief from power famine as only temporary. In his statement to Congress he said: "In a few months, and especially in the regions mentioned, I anticipate a greatly increased demand for energy, for which present facilities are inadequate. This demand will follow the resumption of industry under the operation of normal economic laws and in the face of international competition, factors that have been largely inoperative during the war. If the country is to reap the full benefit of this returning wave of activity it must be prepared to furnish industry and transportation with an adequate, dependable, and economical power supply. Only by increased economy in the production and distribution of power will it be possible for our manufacturers to decrease their production expenses and compete successfully in the world's markets, maintaining at the same time the American standard of wages and living."

The subject is ready for investigation. The history of electrical development can be found in the files of technical and trade journals; census reports and reports of State Public Service Commissions contain carefully compiled data from which can be printed in somewhat broad lines the picture of conditions of demand and supply. Yet we lack many of the basic engineering facts upon which intelligent planning may rest. To fill this need the Geological Survey has undertaken a power survey of the United States. This survey is economic in its aim; it seeks to learn the facts relative to the sources from which power may be obtained and to compile all the facts relative to the existing plants, the quantity of power produced, and the growth of power requirements. The Secretary of the Interior has asked of Congress two appropriations, one of $50,000 for continuing this power survey covering the whole United States, which was begun in cooperation with the Fuel Administration and at its request, and the other of $200,000 for an intensive survey of the region where power requirements are most congested.

I have already referred to the broad outlook of the public utility official who constantly watches the changing demands of his city, and now Secretary Lane proposes with the same purpose to study power conditions in the whole country, so that we may all see the picture of present conditions and the possibilities of future growth and may be able to plan to meet that growth with the greatest economy to the Nation in fuels, labor, and materials. As the first field of work, he has selected that area of maximum power density which he has chosen to call the North Atlantic Industrial District, an area that has somewhat indefinite geographic boundaries but that is clearly defined industrially and economically. In this area, extending from the vicinity of Boston to that of Washington or Richmond and covering 50,000 square miles, is concentrated one-fourth of the power-generating capacity of the whole country.

The need of knowing the facts is realized when we try to measure even present power requirements, not to mention future demands. The Boston-Washington region uses 600,000,000 kilowatt-hours a month, most of it derived from coal. The central stations alone consume fully 10,000,000 tons of coal a year; add to this say 25,000,00 tons for the railroads in this area, and we begin to appreciate in a general way the part coal plays as a source of motive energy.

In conducting these inquiries the Geological Survey must of course rely upon the cooperation of the electrical industry, and, as was expected, this cooperation has been almost universally given, the Survey's analysis of February operations representing over 92 per cent of the output of the country. You will realize that a monthly report of the country's power output makes the most sensitive of business barometers, for unlike coal and steel records it is unaffected either by any carried over surplus or by orders for future use.

I trust, too, that this cooperation is not one-sided, for the Government bureau is in a position to assist your industry in many ways. I may mention one way: The manufacturer seeking a location for a new plant comes to the Geological Survey with his statement of requirements in raw materials, transportation, power, and labor. From the knowledge obtained from you gentlemen, this Government bureau is able to suggest localities where he will be likely to get power at reasonable rates and to refer him to several power companies that can meet his requirements. The average manufacturer seeking power is today very much in the dark, and any clearing house where the industrial man can be introduced to the power man and where the only wish is to do both a service must be of real value to the industry.

I have said that the proposal of the Secretary of the Interior is one of broad planning for the future power supply, but the facts that would be gained from such an engineering study are of course not yet available. My own picture of the super-power system that would effect the economies demanded by the rapid growth of this industrial region includes a multiple transmission line of high voltage with its thousands of steel towers extending from Boston through our Eastern States, crossing the Connecticut near Springfield, the Hudson at Poughkeepsie, the Delaware near Easton, and the Susquehanna below York, and so on to Washington and Richmond. Into this unified system large-unit steam-electric stations at tidewater and near the mine mouths and hydro-electric stations—20 or more—at old and new sites would deliver energy as required, and from this great power main would flow the energy to serve a score of railroads, hundreds of public service companies, thousands of manufacturing plants, and millions of homes.

As one of my engineer friends remarks, this project would appear a "large order," and at first it staggers the imagination, but such a super-power line extending from Boston to Washington can not be termed only a dream. Secretary Lane has pointed out that in his own State of California there are systems of electric transmission comparable with this in length if not in capacity. If you take your map of the United States and make the West move East—which I admit is contrary to human experience—you can take one end of an existing trunk power line, which is at Tonopah, Nevada, and lay that on Boston, and then the other end of the line, which is actually at Yuma, Arizona, can be placed at Norfolk, Virginia. What we dream for the East exists in the West, where the extreme tentacles of one system of interconnected power plants now have a reach of nearly 500 miles.

The investigation of such a project demands the best engineering talent of the country, and Secretary Lane's desire would be to seek the full cooperation of your industry, thus linking up with the public servants in his Department the engineers in private practice or corporate employment whose experience is absolutely essential in considering so complicated a plan. The public interest in such an interconnected power supply is preeminent, but whoever suggests that the project is one for the Government even to investigate independently neither appreciates the magnitude of the scheme nor realizes the limitations which hedge about a Government bureau. If Congress authorizes this engineering study your cooperation will be sought because it will be needed.

There is danger in grand totals and in general averages. The actuary's figures on the expectancy of life mean little to the sick man who knows that his days are numbered, and so to the coal consumer on the Atlantic coast the average life of America's great coal reserves means much less in dollars and cents than the approaching exhaustion of the fields that lie nearest his boiler house. As a nation bounded by the two oceans, we own 55 per cent of the world's coal, yet the tonnage remaining in the great producing fields of the East is so limited as to make coal saving a topic deserving the best thought of those concerned in power generation. And coal from the more distant fields will be more expensive coal.

But Secretary Lane's power program means more than saving in coal; it means saving in man power. One outstanding lesson of the war was the value of the workman behind the lines, and labor shortage became one of the limiting factors in the industrial support which we were able to give to our soldiers in France. Skilled labor is a resource, in which no nation is richer than America, but this human resource also deserves to be conserved. It is an axiomatic truth—not, however, known to all peoples—that the modern machine multiplies man power, and the increase in our use of mechanical energy is a true index of the ever larger value we are giving to the workman behind the machine.

So this program that calls for "an adequate, dependable, and economical supply of power" is a program of national thrift; it involves the best use of both material and men. The electrical engineers and the business executives of the great public utilities can see with clearer vision than mine all the benefits that will come with a largely increased use of electric power—what its value will be to industry, when cheap energy is distributed over the length and breadth of the industrial zone between Boston and Washington. In no way can we better prepare ourselves for the period in the world's history that may come to be known as the Industrial Renaissance.

Meeting the need for cheap power, however, has far more than a local significance. Cheap power is already an asset of the first rank to any country in the international contest for world markets. With the strategy of war fresh in mind, we may look upon this Atlantic seaboard industrial region as the American front trench in the commercial rivalry among nations. This is the reason that Secretary Lane, while asking Congress for a general survey of the power resources of the whole country, wishes also to make this more intensive study where the need is greatest and most urgent.

America's comrades in arms, France and Great Britain, are wide awake to their peace needs. They recognize cheap power as a key to the markets of the world, although the reference in British reports to the electrical industry as a "key industry" doubtless means that electric power is the keystone in the national industrial arch. Already, in England, five official commissions have submittted reports on the question of power development, in which they emphasize the national importance of cheap power as a vital requirement. They consider electric power as essential as labor and materials in economic production. They reiterate that in England less power is used by certain industries than is used by similar industries in the United States, where the larger net output per operative employed and the higher rates of wages show the advantage both to capital and to labor.

In working out their national program these British commissions condemn the existing provincial and parochial systems of generating and distributing electricity and urge a centralized and unified power system as the only method of conserving their coal supply by getting the fullest value from every ton consumed and thus furnishing cheaper power to the industries, large and small.

Our interest as citizens in these plans for cheaper energy is far more than a commercial interest. Public service is a term that has come to attach itself to your industry, and not without reason. The organization of the Nation's business to obtain the lowest costs is distinctly a matter of public service, in which corporation and Government bureau may well join efforts, but success in this organization of industry is not to be measured in dividends alone. Tomorrow prosperity must mean profit-sharing on a thoroughgoing scale, in which we shall all receive in proportion as we have served. I like your President's up-to-date Euclid: "The revenue from contented customers shall equal the satisfactory return for labor and capital"—a triangular partnership in which the public angle equals the sum of the other two equal angles. So the industrial program which emphasizes mechanical power is the most effective assurance of better conditions for all who work in this busy world of ours. To improve living conditions for all our citizens must be the aim of those to whom is given the privilege of leadership in industry. Secretary Lane has said that "Upon our shoulders rests the burden of proving that free government can live. America is the ultimate citadel of human liberty."

Someone recently referred to the craftsman days—the era of the cathedral builders, when men sang at their work because they found joy in it. Yet even in those seemingly golden days of the past there was toil, and much of it of the kind that raised no song to the lips. Is not the present day nearer the golden age of human labor? The man on the farm tractor is more likely to sing at his work than the man with the hoe or that toil-bent couple pausing to listen to the Angelus. So, too, the electric current that makes human labor more productive can also give the workman time to think and sing. To make this America of ours a better place to live in is the program for the electrical industry; that is your part in public service. (Applause.)

W. W. Freeman, Cincinnati: I rise for the purpose of voicing the appreciation which I am sure exists on the part of all who are present of the courtesy extended to the Association by the Department of the Interior in having Director Smith come here and address us this morning.

It seems to me that two points have been made very clear, which should be encouraging to us. The first is in the benefit which will come to our industry in the immediate possibilities of an extended development of the power business. This is the National Electric Light Association because when it was formed lighting was our primary and practically only business. At the present time it represents but a very small percentage of the income of most of our properties. But we are told this morning, and we believe, that what has been done to date in the development of power business is small in comparison with what we can do and what we will do.

Aside from that message of encouragement, it is most interesting to note, although I think it is not new to many of us, that there is today an appreciation on the part of our Government of the part which this industry should and can and will play in the conservation of our natural resources. We have been told this morning of the importance of the utilization of electric power in the preservation of these resources and in the development of the industries of the country.

A very large part of the activities of this Association during the past year has consisted in very direct cooperation with governmental agencies, and the invitation which comes to us this morning from the Department of the Interior, with regard to power survey and cooperation in the matter of power development and utilization of natural resources, will, I am sure, receive a very hearty response on the part of our members.

I merely desire to move a sincere vote of thanks to Director Smith for his address, and with it an expression of willingness and desire on the part of this Association to cooperate with the Government along the line of action proposed.

JOHN F. GILCHRIST, Chicago: I would like the privilege of seconding Mr. Freeman's motion. I know that we all want Mr. Smith to carry back to his Department in Washington a feeling of the full appreciation of this Association in what he has done for us in coming down here and giving us this talk, this excellent address, the news of which will go out from here and do a world of good throughout this country. What he has said will give new heart to many of us, after having gone through a period of great stress, and we certainly thank him for his encouragement.

One thing in Mr. Smith's address impressed me particularly, namely, the evidence that our Government and the general public are beginning to appreciate the position which the public utilities occupy with relation to the prosperity of the country. I think the utilities themselves are seeing their real position as public servants—the dignity of it, the fact that they must be public servants in the fullest sense. There is, as President Wells has said, a satisfaction in rendering good service entirely apart from any remuneration which may come from it.

The public utilities of this country are the workhorses of the farm, and no farmer, no matter how ignorant, ever thought of economizing by starving his work team. The utilities must be allowed to acquire such strength and resources as will enable them to keep pace in their ability to serve, with the growth of this great country.

I see also in the foresight which the Department of the Interior is exercising, a great hope for the country in coaxing the young men back to the farms, and keeping them satisfied. We have all of us appreciated the dangers which must result from the further drawing away of labor from our rural districts. During the past few years there has been a severe shortage of labor in the rural districts which has threatened the prosperity of the country. We now note that the boys who have been on the other side, on arriving in New York, do not want to go any farther. They have seen more of the world than they ever expected to see—they have seen a good deal of the life on the other side of the ocean—life in cities—and they like it.

The only way to get sufficient labor on our farms, where potentially the great prosperity of the country exists, is to make living conditions on the farm and in the rural communities at least approach in attractiveness such conditions in the cities, and I do not know of any industry, unless it be that of the construction of good roads, which will do more to bring the people on the farms of our country in close touch with the cities and within the reach of their attractions, both from the standpoint of recreation and education, than our industry. But in order to get results in this direction we will want the help of the Government. Those of you who have attempted to serve farm communities know how difficult it is to do so, but some way must be found by which we can serve them, and do it with a proper return on the investment required, and in a way which will make the service thereby rendered to the farmer possible at a reasonable price.

I take great pleasure in seconding Mr. Freeman's motion of thanks. (Applause.)

THE PRESIDENT: Gentlemen, you have heard the motion. Is there any discussion?

(Motion was put and carried by a rising vote amid applause.) Meeting then adjourned.

COMPANY SECTIONS DINNER

Wednesday evening, May 21, 1919

During the dinner, Mr. Frank A. Birch, Chairman of the Committee on Company Sections, called the meeting to order and said:

Gentlemen, allow me to extend courteous greetings to all of you from the Committee on Company Sections. I have the pleasure of knowing many of the gentlemen personally, and before the evening is over I am quite sure we all shall become well acquainted. Perhaps some of the gentlemen present are not familar with the reason for the appointment of the Committee on Company Sections, since it is only five years old. Like our industry, the National Electric Light Association has grown to very great proportions in the last ten or fifteen years. During its growth and the growth of the central stations, a special phase of its work has been the organization of the employees of many of the companies into Company Sections of the Association. At the Philadelphia Convention, in 1914, those who had been particularly interested in Company Sections became aware of the fact that there was no standing committee of the Association to look after their welfare and development. There was a large number of Sections in the organization at that time, but after a Section had been given permission to organize, it was, in a way, forgotten and allowed to drift along in its own individual fashion, and no effort was made toward coordinating their activities or promoting their development, or even increasing their number. As the result of an informal meeting held at that Convention, the Executive Committee of the Association was requested to appoint a Committee on Company Sections, which it did in the fall of that year.

This, therefore, is the fifth year of this Committee's existence. They have been pleasant years. We have learned lots of things, have encountered many difficulties and feel that we have surmounted most of them. The war, unfortunately, affected the Company Sections to a great extent. Many of the young men were taken for military service, and, as a result, many of the Company Sections were forced to disband. We still have a goodly number of Company Sections, however, and we feel sure that the time is not distant when all of the former Sections will reorganize and resume their former useful activities. We also feel sure that we shall, in the next year, largely increase the number of Sections.

We have a number of distinguished guests with us tonight. Mr. Doherty kindly consented to meet with us and favor us with an address. Mr. Wells, our president, and Mr. W. C. L. Eglin, one of our past-presidents, are here. I think we all know Mr. Doherty and Mr Eglin as the fathers of the Company Section. Due to these gentlemen and their foresight, we have been privileged to organize useful adjuncts in a great many central stations. Mr. Wells and Mr. Eglin are obliged to leave in a few minutes, and I have asked Mr. Wells, our president, if he will say a few words at this time. I have pleasure in introducing Mr. Wells.

PRESIDENT WELLS: Although I have an engagement for another dinner downstairs at which I am now due, I could not resist the temptation of coming in for a moment with Mr. Eglin to wish you all success in the reconstruction of the Company Sections.

I wish to congratulate you on the excellent work that your committee is doing. If Mr. Doherty and Mr. Eglin are the fathers of the Company Section movement, I think that Mr. Birch might be termed the sponsor, as he has done more than anyone else in carrying the work along. Two or three years ago he presented plans for the modification of Company Section work. The Executive Committee did not think it desirable at that time to make the modifications suggested, but Mr. Birch was not daunted and continued working faithfully. The result is that this morning at the meeting the amendments to the constitution were adopted so that the Company Section work may be modified to meet the needs as outlined.

This dinner will give you an opportunity to hear Mr. Doherty and then to discuss plans for the coming year, and I feel a lot of good work will be done for the Class B members and the employees of the Class A members. The Company Section is one way of bringing the educational facilities of the National Electric Light Association to the Class B members, and I know of no one better qualified to further this work than your good chairman, Mr. Birch.

The Chairman: I am sure that we all appreciate the greetings of our President, and we are sorry that he has not the time to say more to us, because I know he could, and I know his heart is in this subject, because it has been my privilege to be in consultation with him frequently during the last few months, and to him belongs the credit for the reorganization of the Company Section work this year.

No meeting which pertains to the Company Section movement would seem complete without Past-President Eglin. He also is in a hurry to get away, but before he goes I want to ask him if he will not kindly give us one of his characteristic messages of encouragement and optimism.

REMARKS OF MR. W. C. L. EGLIN

Mr. Chairman and Gentlemen: I am not in a hurry to get away; I should like to stay here the balance of the evening, but a previous engagement compels me to leave shortly. The point I want to bring up, and I am going to be very brief, because those of you who know me best, know that if I have anything to say, I say it right to the point, and sometimes it is said I say it a little too sharply. There is one thing I can state without any idea of flattery: Mr. Doherty is not only the father of the Company Section movement, he is very nearly the father of the whole Association. The Association, of course, was born when he was a very young man, but he has progressed in our industry until he is recognized as one of our leaders—not only here but abroad. I had the good fortune to follow Mr. Doherty as President of the Association, and he made certain radical suggestions regarding its organization and its work. He made a few remarks about my silk stocking ability, etc., and he rather stirred me up a little bit. He said: "I have laid out quite a job for you, young fellow, and you have got to go some to carry it out"—and I proceeded to go.

The one important thing I want to say about this Association is, if I could get every man in the Association to have the feeling for it that Mr. Doherty has, if every man could have his vision of what the Association means to the industry, what it means to the individual, then there would be no trouble about this Company Section proposition.

Now, of course, in carrying out any movement, in carrying out any good thing, there are always difficulties, and one of the first difficulties we ran into was the so-called "company club" of various kinds. Philadelphia had such a club, Boston had one, New York had one—and many of the other companies had one—and consequently, in the first year of the Company Section movement we had great difficulties. They said, "This is a fine idea, but we have this Company Club now, and we are not quite ready to change." That was one of the first difficulties we had in the early years of the Company Section movement.

The value of the Company Section idea has been shown, and with the modifications we have now, which your Committee has recommended in the Constitution, there is no reason any longer for the existence of any club or company organization except the Company Section of the National Electric Light Association.

Mr. Doherty will undoubtedly tell you what it means to be a member of the National organization. That is the only thing that counts. I mean that you do not want to be merely a local individual. You want to be a national personage, and if you are ever going to progress, you must keep these high ideals before you. You must make your ideals as high as possible and endeavor to reach them. This is the starting point, it is true, but who wants to stop and be provincial? You must aim high, or you will never get anywhere. The Company Section is the place where the presidents and the other officials of the National Electric Light Association are going to be born, and that is the thing you must appreciate. The N.E.L.A. as an organization has a tremendous work to do. It is true it has done great work, and the ability to continue this great work must come from the proper training of the men who are going to follow you and follow me

I feel more strongly today than I ever felt that the most important work the N.E.L.A. is doing is in the fostering of this

Company Section movement; important not only to the Association, but to the individual members.

One of the meetings in our Company upon which I will always look back with the greatest possible pride was the Company Section meeting this winter, which filled the entire ballroom of our largest hotel in Philadelphia—the Bellevue-Stratford—and at which nearly two thousand persons were present. Now, can you imagine an N.E.L.A. meeting with two thousand present at one time? It would be talked about all the year, and here is a local Company Section "putting that thing across." It is true we had a number of guests, and that is the purpose of these things—the getting together—and that big meeting of two thousand people was carried on, with respect to all the details, and was presided over by a man who holds, you might say, a minor position, a man who would not be able, some people might think, to conduct such a meeting. You would expect it would require a man like Samuel Insull to conduct such a meeting, and yet a junior in our Company conducted that meeting with dignity, with credit to himself, with credit to the Company Section, and with credit to the Philadelphia Electric Company.

Any movement that will bring forward the younger element of the company, and give it an opportunity to show what it can do, is worth every ounce of pressure that we can put behind the movement to help it along. That is the one message that I want to give to you tonight, and I thank you very much for being so patient in listening to me.

JOSEPH D. ISRAEL, Philadelphia: Three cheers for Wells and Eglin. (The three cheers were heartily given.)

THE CHAIRMAN: Many of us know each other, but I do not believe everybody in the room knows everybody else. Every man here is interested in Company Section work, or is perhaps an official of some Section. In either case, a man who has done a good thing should not be ashamed of it, but should advertise it.

I am going to suggest a simple way for us to become acquainted. I will ask our Secretary to read the list of those who have made reservations for the dinner, and as he calls off each name, will the gentleman whose name is called please rise in his place? In that way we shall see the timber that goes to make up the Company Section dinner. Mr. Doherty has just given a better suggestion, and that is that each gentleman get up and announce his name and business connection.

(This plan was followed out, and the service of the dinner was then resumed.)

At the conclusion of the dinner, Chairman Birch called the meeting to order and said:

Gentlemen: This meeting is called for the purpose of discussing Company Section work. We have tried to make the meeting as informal as possible and we want every one present to feel at liberty to get up and say what he thinks about the Company Section, but we should like to have all of the remarks confined to Company Section work, as our time is limited and we want to get as much out of this conference as we can. Mr. Doherty is probably the oldest Company Section man and knows more about the Sections than any of us. I know he has an important message for us and will ask him to address us at this time. Gentlemen, Mr. Doherty.

(The company then joined in singing: "For He's a Jolly Good Fellow.")

ADDRESS OF MR. HENRY L. DOHERTY

Mr. Chairman and Gentlemen: I have been trying to avoid every sort of a speaking engagement lately, but I accepted the invitation to come here with great pleasure, and I really consider it a wonderful opportunity to be able to talk to you men. I have the greatest faith in what can be done, as Mr. Eglin says, through the Company Section movement for the man and the company, and heartily concur in what he said, and I believe that there is a great future for this Company Section movement.

You can shut me off whenever you want to, but this is an opportunity I desire to take advantage of, and I do not want to stop until I know that every man here is as enthusiastic over what good Company Section work means as I am. First, I am a believer in business—I am a believer in the philanthropy of business. I believe that Mr. Carnegie as the great ironmonger was perhaps more a real philanthropist than Mr. Carnegie was as a philanthropist. You or I, perhaps, go out and develop a water-power in some Western city, and carry the current generated by that water power to the nearby cities and markets. We start in, as a rule, by furnishing those who have been generating their own power with current at cost, we will say, or half, or even as low as one-tenth of what it cost theretofore, and it is really interesting to think what the business man does for the people at large. You know a healthy business is always founded on serving the public with some commodity, or something, at less than its real and actual value to the public.

In a business of that kind there are two elements: one is the cost of production, that you cannot get below, as a whole, on the average, and the other is the value of the commodity or the service to the public. Between these two limits the price must be fixed, and you perhaps have as much right to fix the price toward the upper line as toward the lower line; yet the tendency today is to crowd down toward the lower line, even though the service we perform and the commodity we furnish are worth, from the value of service rendered, several times what we charge for them.

There is no philanthropist like the business man who puts his business on a good, sound business foundation of selling his service at less than it is worth, really, to the consumer, and when you have done all you can to civilize mankind with schools and churches, then start in business and you will make real progress in civilization, if the business is carried out on correct lines.

Now, we have a school system, and I sometimes question its efficiency. You know we turn men out of our schools and colleges and each one has exactly the same education that the other fellow has. They are just like so many postage stamps. A postage stamp, you know, is a beautiful steel engraving, but it is worth only two cents, and it is not the education men get in schools that makes them valuable. What makes them valuable is the education they get of a specialized nature, that the other men do not get in school, and that is where the Company Sections can train these men.

We have a lot of people in this country who, no matter how little or how well they are educated, are overeducated and undertrained. Now, we must change our methods and go in more for training, even though we extend our system of education, but the training is the important thing. Our facilities for training are very limited, and I know of nothing that offers the opportunity for training that is offered by these various Company Sections.

First, I want to say this, Mr. Chairman, that I did not come here prepared to make an address. I am going to talk to you simply about whatever comes to my mind. It may not be and probably will not be in good order and sequence, but I hope that here and there I can give you some suggestion that will be valuable in this Company Section work.

You know that work well done is a pleasure. Work that is done simply for wage is always a hardship. I know what can be done in the training of men. I have taken men who could not read or write and have taught them to analyze their fire in the boiler room and to analyze their flue gases and be able to tell what it means—to tell what over-ventilation was, and to calculate from tables what their loss was in coal, having proper flue gas analyses. When you get men interested in their work, the work becomes a pleasure.

I have been worried over the situation I have seen developing throughout the United States during the period of the war, and especially since our country became involved in it. It seems to me, no matter where I go, I see a woeful lack of pride in workmanship, and I hear a great deal about incompetency in workmanship. There is no longer any great pride in service. You see that in every hotel you go into. It has worried me—this tendency to fail to do the best than can be done with each particular job of work. I have feared that it might creep into the organization I have founded, and I have tried to keep the interest of my men up to the point where they would do the best possible work that can be done in each individual case. I have also a keen interest in the entire electrical business, because I have devoted so many years of my life to it.

The public is interested in the electrical business—it believes its interest in the electrical business is in getting low rates. That is not true. The public is primarily interested in having complete service from a geographic standpoint. There is very little satisfaction in having service selling at some place at little cost, when you cannot buy it at all, so the public is interested primarily in complete service from a geographic standpoint; secondly, in good service, and thirdly, in low prices. Every time I have to deal with these problems affecting service, which come up in the central station business, I think how these things may be made plain to the public through educational work carried on in the Company Sections.

For instance, we have a problem on our hands now that is national, and involves even the continuity of the present form of government in this country. I do not know whether you men appreciate the enormous amount of unrest and threat there is to the existing order of things. I have been serving on a committee that has been trying to do some work along that line, and we know that there are in existence in the United States over four thousand Soviets, fanatics, who believe there is some other road to wealth, to existence, than by work. These men are prepared, at some opportune moment, to grab control of the property of the country and live without work.

Unfortunately, we are going through a period of time when there is no class of society in America that has not these resentful members. Our wealthier people resent the heavy taxes that are imposed upon them, and which I myself think are thoroughly unjust and unnecessary. Our business enterprises are taxed without any justice whatever, because a corporation is, after all, a poor man's partnership, and when the corporation must pay, and the stockholders afterwards must pay, it is an unreasonable form of taxation. You can sift down through the list and find other classes of people in this country which have members who are resentful of the existing order of things. We have the peculiar situation of a number of classes of men of the most diverse opinions who are opposed to the existing order of things and condemning more or less our form of government.

I refer to the talk made by Mr. Gordon last night as an illustration of what a wonderful thing it would be if our Company Sections were so organized and conducted that the company could always reach its employees through the medium of the Company Section, and reach the public through the Company Section by way of its employees. I have always had a rather large vision of what could be done in this Company Section work. It is no idle dream on my part—it was once. I have been a dreamer all my life, and I have spent the biggest part of my life trying to make my dreams come true. I have repeatedly organized men, and not having the opportunity of organizing them as a branch of the N.E.L.A., and not having the added incentive of pride and aid that would come from that, I have organized my employees along general lines, and have been largely able in that way to maintain a proper understanding between the company and its employees, and also in that way have my employees interpret the company properly to the public in these cities. It can be done, not in one case only, but in all cases.

We have the men to think about, because there is many a good man who has no particular opportunity to get ahead. I may be the manager of the plant. I may not know I have talent underneath me. I remember once I was the president of a company, and I was in the habit of having a meeting of the heads of departments. The men also had an organization of their own, and they called themselves, jokingly, the "House of Representatives,," so I termed my meetings the "Senate," and we had a good-natured fight back and forth—a rivalry as to which of the meetings could be more successfully conducted.

A new manager was appointed in this company I refer to—I was not thoroughly in control of the company—and this new manager was appointed. Later on I found he rather resented talking to the men who occupied subordinate positions and he was not in the habit of attending the meetings of the "Senate." I called his attention to it once or twice, and one day he confessed to me he did not think it was the proper thing to sit down and talk to these men on terms of equality. I said, "There are better men than you and I in the New Business Department soliciting for $75 a month." There is a lot of truth in that—you have many excellent men in the organization you do not know anything about, and you can bring about a knowledge of their excellence only by some such organization as the Company Section. The Company Section is a means of showing you what talent you have, and also a means of developing talent.

I do not know how many of you men are college educated men. I am not. I often wish that I were; I wish that I had had a college education, but I did not have the opportunity. It has been a great hardship to me not to have had such an education, but sometimes I think it has been a great blessing. During the past two years I have been engaged almost entirely in war work, trying to work for the Government as engineer, working with various departments and passing on various things, and have had to contend with many of the scientists who were in the Government service when the war started, or were drawn in after we entered the European war. I rather concluded before the war was over that I was awfully glad I had not had a college education, because the man with a college education is blessed with the same knowledge everybody has and is cursed with the same errors. The man who has educated himself will come to his viewpoint by some other process, and if he is wrong he has lots of people to correct him, and if he is right he can generally demonstrate it.

I do not know of anything that will aid the cause of democracy more than to give the fellow who has not had an education a chance, and I want to tell you fellows who have not had to try to educate yourselves that it is a problem, but it is marvelous how much we can pick up by association with other men and by hearing things discussed. I do not know whether you have thought how much easier it is to get information from the other man than it is to get it from a library. If you want to put a library on a par with getting information from a man in conversation, you want to invent a library in which you can speak to any book on the shelf and it will jump off, open to the right page and tell you what you want to know; and when you do not understand it, you can ask it a question and it will answer you. That is one of the reasons why there should be association between individuals, and anything that makes for that association makes for education.

You know that the American public is imbued with one idea, amongst many others, and that is letter writing. They think that the man who is illiterate is ignorant, and the man who is literate is wise. I think the biggest damn fools I have ever known in my life were thoroughly educated, and many of them had doctors' degrees, and I think some of the wisest, brainest men I have ever known have been men who have not received any extended education. In one instance it was a man who could neither read nor write, and in another case a man who had had but two years of schooling. I remember a letter I once received from that man, that I thought was the greatest sample of the proper use of the English language that I ever saw; it was about two pages long, and you did not need to add a word to it, and you could not take a word away from it, because it was so perfect and concise. There was not a capital letter nor a period nor a comma, nor any other punctuation in it, and yet you could not mistake what that letter meant; it was as clear as a bell. I took it back to my office and I said: "Fellows, don't for a moment think that I believe, as many of you do, that grammatical English is good English. Here is a letter which I consider written in the most perfect way, and if you can write as good English as that when I am in London and you send me a cablegram—because punctuation marks do not go in cablegrams—I shall be satisfied." So we must learn to distinguish between the real thinker with real brains and the man who does not possess these qualities, and not whether the man simply uses proper grammar when he expresses himself, either in speaking or in writing.

We have a lot of undeveloped talent in the companies, and we can do a great deal to develop that talent. I do not think that Mr. Edison has had much schooling; I think, as a matter of fact, he had but very little. Many of the men who have educated themselves have made great successes of themselves; in many cases they are more successful than the man who has the benefit of a college education. More of the men would have made successes of their careers if they had had opportunities leading to success, and we can give that opportunity to the men in our various electrical departments through the medium of the Company Sections.

I have not seen the inside of a schoolroom as a student since I was twelve years old. I did not have the good fortune, as some of you had, to work with men who had college educations. In the first company with which I was connected we never had a man in our employ who had more than a high school education, and a high school educated man was a rarity; those were the surroundings under which I had to try to educate myself.

When I was in school I did not even learn how to study, and as a consequence was not very far along in my studies. When I realized what an ignorant little rascal I was, I tried to educate myself, and I know of no more difficult task I have ever had than that. I did not know how to study or what to study, and did not have anything to study with. Most of the education I had I got out of catalogs around the office—a book on Heat, and Trautwine's Handbook, and a few things like that, and from these things I got the rudiments of my education. In our companies there is no reason why the boy who wants to get an education cannot get it, and we ought to carry the opportunity to get it to him largely through these Company Sections.

In my own organization I have tried to teach pride of workmanship and pride of service, and that ought to be the keyword of the entire electrical fraternity. At the time the war broke out I received a letter from a friend of mine who is a United States Senator. When I read it I was about as mad a man as you could find any place, because the letter virtually accused me of staying on the job and trying to make money while the country was at war, while, as a matter of fact, I happened to be one of the men whom the country most needed, being a man who had carried on organization work all my life and had made a success of it. I did not answer the letter for several days; then I undertook to tell this gentleman that organization such as the Government proposed would be impossible without the electrical service it required, and that I was continuing my business because it was a war necessity, and was devoting all the time I could to other Government work. The organization work I have done has been successful—and I say that, perhaps modestly; it has been successful because I depended primarily on inspiring my men to the point of taking a great interest in their work. My first executive job was as foreman over a few Irishmen, and it did not take long for me to learn that if I wanted these men to work while I was captain, I had to do it by some other method than the man who could stay on the job and swear at them. I tried to get them interested, and to work for me as a matter of friendship; but when it comes to military organization, and carrying out a war program, perhaps that plan will not do; but in private work, especially in our electric light business, that system will work, because I have worked it. I have tried to make business pleasant in our different organizations, and whenever business could not be made pleasant I wanted to leave it, because I believe there is more fun in working than in playing, and I believe that every man can find pleasure in his work if he chooses to look for it.

I believe in the entertainment feature of these various Company Sections, but I do not think that should be indulged in too much. I do not think you want men who are members of the Company Sections simply for the entertainment they get. I believe we can make these Company Sections educational in the highest degree and yet make them thoroughly entertaining.

I sat last night and listened to Mr. Gordon talking on socialism. It was a very instructive thing to me, and I derived more interest and more pleasure out of it than if I had gone to a theatre. A few weeks ago when I was down in an oil field in Texas with a party of gentlemen—we were down there to look over the property—I looked in a doorway and found a blacksmith at work. He was a very pronounced example of a master workman, and I stood there and admired him for a long time, and in the meantime the group of gentlemen who had gone further down the street, returned and said: "You fool, did you come down here to see a blacksmith at work, or to see the oil fields?" I said: "I am getting a good deal of satisfaction in seeing this man work, because he is a master workman." He had a class of work to do in which he probably took pride, but every man cannot take this pride in his work—it depends largely on the circumstances around him. Pride of workmanship is a self-exciting thing, and neglect of workmanship is a self-exciting thing in an organization, and you can build it up or down; the tendency is to build downward, unless you decide to build upward.

I know the history of the growth of this business. I remember well when my father came back from the Centennial Exposition in 1876, when I was a boy six years old, and told about having seen the electric light and also the telephone. Later on, when the first arc plant was run in the city where I lived, I fired the boiler the first night. So in the span of a lifetime I have seen the electrical business develop.

I have known personally the men who have contributed to the great inventions, especially among the American inventors, and the bulk of the work has been done by Americans.

Speaking now of the science, not of its application, ours is the newest science we have, and yet the most wonderful and accurate. During the period of our war work, I had a great deal to do with airplanes. I knew nothing about them until the war broke out, and when I was called upon to do this work at that time I secured all the text books I could on them—and they looked awfully learned. After I studied the text books for a while, they did not seem to read true and I then commenced to study them very closely, and I came to this conclusion: That my acquaintanceship with men engaged in airplane work, with the men who had taken up this particular branch of science, showed me that the men who were earlier engaged in the work were highly imaginative, and then they had been followed by the men who were highly academic, so well grounded that they could scent ideas and principles, such as the development of the electrical business, at night, and I got into the business of demonstrating the possibilities of the airplane. We have had the most wonderful work with the greatest brains of our generation applied to this science.

I hear many people talk of electricity being in its infancy, and I have reached the point where I cannot help smiling when I hear the statement, because the science, as a science, is so nearly developed that you can make the statement referred to of almost any other science, and it would have greater truth; but the matter of application is different. It took many years after the steel plow was invented to get the man to discard the crooked bough to plow with, and we are awfully slow in getting the extensive application of electricity that should be had. Electricity has not been applied to anything like the number of uses to which it can be applied, and I do not know the limits of its application. I cannot visualize them.

If I had my chance to be a philanthropist and work for the good of mankind, I do not know of anything better that I could do than to start out and put a fan in every home. You would do a great deal more for humanity in that way than nine hundred and ninety-nine out of every thousand preachers do. I remember one day several years ago I saw a little woman, a rather frail looking woman, wheel her baby out across the sidewalk in a little bit of a cart. I had not seen one of them before. She wheeled it out to the street car and took her baby out, and the baby looked as heavy as a chunk of lead. When she got on the car with the child she folded the go-cart up into a form not much bigger than a little leather music case, and I looked at that and thought that the man who developed that little baby cart did more for the good of humanity than all of the reformers who have lived during my lifetime. All they did was to promise to give salvation to man in a future state. The work we are doing is real, present-day work, and we are working for the good of the public and for the comfort of humanity. The men must be taught in some place how to do that work, and inspired with the necessity of that work, and the place to do that is in the Company Section.

In inaugurating this plan for Company Sections we had in mind this objective—that there must be some place to develop men who can take larger and bigger positions with their own companies, who can take larger and bigger positions in the electrical field; and that we would develop in these Company Sections the men most capable of running and operating the State Sections, the Geographic Sections, and from the State and Geographic Sections we will find the men best capable of running the National Section. Unfortunately, we have had a great many things to contend with.

I am responsible for the plan of reorganization of the National Electric Light Association which was adopted in 1908, and it rather amuses me every once in a while when somebody comes along and is going to change it, for, as a matter of fact, they do not know what is in the present plan. It resembles the reformers who are always going to change the Constitution of our country and our form of government, without knowing what the present Constitution is or what our present form of government really is. I often say that our forefathers gave us a piece of pure Colonial architecture; then along comes somebody else who wants to tack on a piece of Queen Anne architecture, and someone else who wants to tack on a piece of Mary Ann architecture, and they are in this way likely to crucify the whole structure.

That is true of the plan of the National Electric Light Association. We have quite a wonderful plan, and if you study it you will find this: First, that any group of men interested in promoting anything in the electrical business can, by petition of a certain number of Class A members, company members, form a section to carry on the work that they are interested in—it does not require a large number. If you have a hobby and find other men who have the same hobby and want to form a special section for the furtherance of this hobby you can do it. And the authorization of the Executive Committee with regard to the formation of these sections is mandatory and not discriminatory. The idea involved in our present plan is to try to build up a great big central organization and not have a lot of conflicting organizations, and I look on the foundation of all this work as being the work of the Company Sections, where the first steps towards the development of the men to carry on this work are taken. I also think in carrying on a national organization of this sort we do not want to make the men go to the work, but you ought to take the work to the men. If you want to show some great theatrical star, you do not import an audience from San Francisco to New York to see that star, but you send the star to San Francisco. In the old days of the stock companies the star traveled about, and he found a supporting company in practically every place where he desired to perform.

I had also hoped that these Company Sections would receive support in the form of a Lecture Bureau maintained by the N.E.L.A., and also maintained by a committee of you men interested in Company Section work. There should constantly be brought to the members of your Sections in your meeting-rooms the most interesting lectures on new developments and machinery, new processes and new ideas of every sort occurring in the industry, and matters of public interest, such as the lecture of Mr. Gordon last evening, should be brought to you.

Another thing I wish to say, gentlemen, is this, and I say this because I am assuming I am talking to men of various grades, from the executives of companies to the men who have never held an executive position—we are all too apt to think that the whole problem of running everything is up to the "big boss," whoever the big boss is. The big boss has so many things on his mind, and so many things he ought to attend to personally, that the most valuable man in a company is the man who thinks out what the big boss would like to have done, and then puts the matter up to the big boss in concrete form. You men are the ones who must tell us what to do to make these Company Sections interesting. I do not think we have done all we could for Class B members. For every five-dollar bill they spend in the Company Section work they ought to get a return in value of service of $50 or $500—they should be given that much benefit, but that does not mean you have to spend that amount of money on them. If I were running one of these big manufacturing companies I would consider it a splendid opportunity if I could enlist the friendship of, and get in touch with, the men who will be in control of the electrical business, and talk to them about the things I am doing, the developments I am planning, the improvements in steam turbines, or anything of that sort.

I will suggest two or three things you can do, and one is this: Have you considered whether you could do more effective work as a National Special Section of the N.E.L.A. and have a Company Section's Section? By working as a Special Section you can elect your own officers from time to time and do not have to go to the Executive Committee to have it appoint them for you; it will merely confirm them. You can make every man eligible to your Special Section who is an officer or has been an officer of your Company Section. This Special Section can bring in every year the men who developed into interesting and instructive lecturers. You can listen to these lecturers and decide which ones you will send out over the circuit. Can you imagine a greater way of stimulating your men to greater effort than the possibility of their being able to make a round through the larger Company Sections to address them? I know that would have been a rare opportunity for me. You know the old story—someone said that there is plenty of room at the top of the ladder. Some other fellow said: "Yes, but what is the use of that, when the bottom rounds are crowded and you cannot get up?" That condition more or less prevails, and the hardship is in getting past the lower rounds of the ladder where you have the greatest competition. As you get up the competition is less severe. The way to stimulate your men to bring out good papers is to give them the opportunity to go out and address the other Sections.

After you have formed your Company Section's Section—and I see no reason why you could not form it at this meeting if that is your decision—you ought to appoint a committee to go to the various manufacturers and convince them that they can well afford to put out lectures, if possible, illustrated lectures, and diagrams, and moving pictures and things of that sort, and have these lectures given by representative men in their companies. I do not know how many of you recall a lecture which the Illuminating Engineering Society put out. I think it is one of the most interesting and constructive things, from the standpoint of illumination. Any manufacturing company that cannot bring before your Company Sections wonderfully interesting lectures, given by prominent men, having to do with their work and representing their work, is away behind the times. In fact, I am afraid our manufacturing companies are behind in this respect, because they certainly are not as much interested in this matter now as in the days when some of the old pioneers were living—men like Mr. George Westinghouse, and when Mr. Coffin was a younger man. But I will do this, gentlemen, if you see fit to take that work up, I will agree to go with your committee and work with it with these people and try to get them to do that. If I cannot coax them into it, I can give them a cussing, and some of you fellows could not do that, because you are not old enough.

I made some notes while I was sitting here, and the first is that I wish I could inspire you with a determination to start in and make this Company Section work the one feature that will stand out in all of the N.E.L.A. work. It can be done. One thing you ought to do is this: Say to anybody who is willing to come out and give a lecture that is well worth while that you will not ask him to go to Toledo and address the Toledo Section on a Tuesday night, and then wait until week after next and then go to Cleveland to address the Cleveland Section on a Friday night two weeks after, but that you can always call a meeting of your Section on twelve hours' notice to hear any of these lecturers who are passing through your city, and that you will suit the time of your meeting to his itinerary. In that way a man can be sent out on the circuit and get back home reasonably quickly, and you will get the benefit of it. You will not need a long time to get your members together, and it is better to follow that plan, to suit the time of your meeting to the itinerary of the speaker, rather than to have the speaker leave your vicinity and perhaps not be able to return again for some time, if at all.

I want to say something in closing about the responsibility of these men for carrying on this work, and if I forget to do it I hope you will remind me of it. There is one thing I have always dreamed I wanted to do, and have not been able to get around to it—in fact, I am fifteen years behind my schedule. But here is one thing: Whenever you see a man, woman or child doing any form of manual labor you can be sure of this—that there is some application of electricity that will either reduce that labor, reduce the strain on the worker, or contribute to his comfort.

Some day I want to go into some city where I have a live bunch of fellows and a good organization of a Company Section, and start out with the determination that we are going to study every form of human labor, and see how we can substitute electricity for it, or make electricity contribute to it in some way. It is a mighty interesting thing, and it is just as interesting as playing a game of cards, poker or what not, to figure how you will make electricity do the work of man. I get more fun out of it than any game of cards I ever played, or any other sort of game. You can see what a wonderful thing you will be doing for the public welfare and comfort in doing that.

I cannot lay too much stress, Mr. Chairman and gentlemen, on the question of the correct attitude of the public, especially toward corporations. You know there has been a general antagonism toward corporations in this country for a great many years, and it has been, to my thought, entirely without foundation. I know that the corporation, as a whole, must inherently be more honest than the individual. Many men have to be identified with the affairs of a corporation; a corporation cannot be run by one man. Corporations must maintain records, and the highest type of honesty will be found in corporations. In the sweep of antagonism against corporations throughout the country, we are the ones most likely to be reached and harmed, and we can go to greater ends in correcting this antagonism of the public towards corporations than anyone else. This can be done best through our Company Sections; as members radiate throughout every part of the city life, they are close to the people in the city, and they can do more to change the sentiment toward the corporation than any other instrumentality of which I know.

I have no sympathy with the chronic kickers who are always saying unkind things about corporations, and sometimes these people are employed by the corporations. I generally converse with the street-car conductor in a strange city when I am riding on the street-car, and sometimes I say, "What kind of a company is this?" Perhaps he says, "They are a lot of rotters." I generally say, "Perhaps there is something wrong with you; I would have more pride, I would find a good, clean company to work for; but are you sure you are not workng for one now?" I have not much respect for the man who works for a corporation he does not respect. That is one of the things we should do with all of our men; we should make them respect the company, and if the company is wrong we should make it right, and if the company is right, the employee should understand it, unless he is one of those fellows imbued with the idea that he should live without working, and in that case the thing to do is to get rid of him.

There is nothing that creates faith in the company like having the man who works for the company say the company is all right and honest and straight. If a company is conducted in that way—and most electrical companies are—it should have that tribute paid to it by its employees.

Just a word in closing: First, I thoroughly appreciate the words of commendation spoken by Mr. Eglin upon my work in the National Electric Light Association; and, not as a matter of reciprocity, but as a matter of justice, I want to say that Mr. Eglin did more to bring about our present development of Company Section work than any other one man. I know of no man who has worked more earnestly and more unselfishly for the N.E.L.A. than Mr. Eglin.

The future of the Company Section depends on men like you in this room—you can make the National Electric Light Association as large and powerful as you want to, and you can, if you want to, make the Company Section a dominating thing in the Association. You can do it for the good of the companies, you can do it for the good of the individual, and you can do it for the good of the public.

I wish I could get you men in the room in a frame of mind where you were determined to make the Company Section work stand out as a great contribution to everybody connected with the electrical business, and I mean by that every customer who is served, every stockholder and everybody having anything to do with the business, and that means practically everybody in the community.

I thank you. (Loud applause.)

The Chairman: After a classic address of this character words are inadequate to express our appreciation of the message Mr. Doherty has brought to us tonight. Sometimes we hear a question raised regarding the wisdom of Company Section activities. Certainly, every man within the sound of my voice I am sure will echo my own sentiments, when I say that having gone through all my work and experience in Company Section matters and arrived at the point tonight of listening to Mr. Doherty's splendid address, I feel more than repaid for what I have done.

So as to take concrete action immediately on one of Mr. Doherty's suggestions, the formation of a Company Section Section, and to get the thing going while we are thinking about it, with your permission, gentlemen, I am going to appoint Mr. Joseph D. Israel, of Philadelphia, Mr. Walter Neumuller of New York, and Mr. William S. Kline, of Chicago, a committee to formulate plans for the organization of this Section and to put the matter in shape for presentation to the National Executive Committee, the idea being that this committee can add to its membership any other gentlemen whom it feels it would like to have work with it. Let us get busy right away and put this thing over, and if Mr. Doherty will kindly consent to act in an advisory capacity to the committee, I am sure we will all appreciate it.

Mr. Doherty: I will be glad to do that, and will do all I can to put the matter through in a successful way.

William K. Kerford, Philadelphia: I move a rising vote of thanks to Mr. Doherty for his interesting address.

(The motion was duly seconded, put to vote and carried.)

Mr. Doherty: Gentlemen, I ought to thank you, I appreciate your attention very much. The pleasure is all mine.

The Chairman: It is now about eight minutes to nine, and we do not want to detain any of you gentlemen who wish to go to keep other engagements, but we should like those who can stay to remain and discuss these Company Section problems. You can go when you like but you can also stay as long as you like, and say anything you like. The meeting is yours.

Mr. Israel: Regarding the possibility of some of the gentlemen desiring to withdraw from the meeting at this time, I am one who has an engagement that I must keep, and there may be others in the same position. Is it at all possible that we could have an adjourned meeting of this Section some time tomorrow morning, if you think there would be enough business to be brought before that meeting to warrant such action?

The Chairman: Would not that conflict with the general and executive session which is on the program for tomorrow morning?

Mr. Israel: I offer that as a suggestion.

The Chairman: I think we had better make use of the present opportunity and have a snappy discussion on Company Section topics. I will call on Mr. Healy.

F. R. Healy, Cincinnati: Looking over the situation as it pertains to Company Sections, as a past chairman of a Section and a member of this Committee, I believe that the real drawback in the growth of some is due to the lack of authority some company managers have in their companies to start an organization of this kind.

It seems to me that wherever a good, live Section is found, you will also find in that company an active member of the N.E.L.A. Therefore, the companies that we will have to work on are usually those that are managed by some local officer who has full charge but at the same time is under authority from some holding company, and if he does not look favorably upon the organization, that is the end of our efforts. I would suggest as a constructive measure that we find out the owners or lessors of the various properties where the Company Sections do not exist or do not thrive and see if pressure can be brought from this source so that any one from the N.E.L.A. can have at least an interview or an opportunity to present the merits of the Company Section movement.

David Darlington, New York City: Mr. Chairman and Gentlemen: I am sorry that every executive in attendance at the Convention did not hear Mr. Doherty's talk here tonight.

Our Company Section finds its greatest difficulty is to have its members appreciate the advantages gained through active participation in the Company Section work. We hope to overcome this by organizing within our Section committees somewhat along the lines of the National Association committees, which can hold meetings and invite to them those members whose work is covered by the committee.

We all appreciate that often a meter reader, bookkeeper or collector, after having spent a hard day at his work, does not feel like giving up his evenings to something that does not interest him. Therefore, it is up to those arranging the programs of the Section meetings to have them attractive as well as educational.

The proposed Lecture Bureau, as outlined by Mr. Birch this morning, will no doubt prove of great value and it is hoped that it can be worked out.

It was interesting to hear Mr. Doherty speak of the possibilities of combating the present hostilities toward corporations through corporation employees and of the opportunity the Company Section has in educating the employee for this work.

E. A. Baily, Brooklyn: I do not want to let this opportunity go by without paying my personal tribute of appreciation to Mr. Doherty for his talk. I am sure every man in this room has food for thought to take away with him, and can work on it during the days to come to good advantage for his own company and its employees. The thing I admire about Mr. Doherty, more than anything else, is that he has the courage of his convictions and is always ready to fight for them.

If Mr. Doherty is the father of the Company Sections, we can call Mr. Birch a worthy son, for I know that during the past two years he has had convictions and has also had the courage to fight for them. The Convention this morning recognized that he is right in his plans and approved the modifications of the constitution designed to benefit the Company Sections.

To my mind the greatest thing the Company Section offers is the chance for the employees to get together and talk over lines of work and become acquainted with one another and get that spirit that comes from associating with their fellowmen.

Mr. Eglin told of a big meeting at Philadelphia, and we have had big meetings in Brooklyn, but you men from the smaller companies should not be discouraged because you cannot bring out a thousand or two thousand men. If your company is smaller and you get a good representation from it in your Company Section, you can get the same results from your organization, relatively, that can be secured from an organization of two thousand men.

In the early days of Company Sections Mr. Israel and myself happened to be chairmen of our respective Sections at the same time, and one thing that helped the Philadelphia and Brooklyn companies was the work of friendly rivalry between our two organizations. The two companies were about the same size. There was great rivalry between these two Sections as to which got out the first Section button. At a meeting at Philadelphia Mr. Israel and myself shook hands on the question, but we kept tabs on what they were doing at Philadelphia and constantly checked up to see what Philadelphia was trying to put over on Brooklyn.

I think it is a good idea for the officers of the Sections, and everyone interested in any given Section, to find out what the Sections in similar size companies are doing, and have a rivalry between these Sections, and something to fight for.

The Chairman: I want to mention a thought which came to me a moment ago. The proceedings of this meeting are being taken verbatim by a reporter, and Mr. Doherty's address will make an excellent article for publication in the local section journals or bulletins. The Committee has a list of all Company Sections which publish a monthly or other periodical bulletin, and with Mr. Doherty's permission, we shall make it a point to have a copy of this splendid address sent to the editors with the request that it be printed in their local publications at as early a date as possible.

Furthermore, the Committee itself has in contemplation the issuing of a handbook on Company Section work. Again with Mr. Doherty's permission, we should like to incorporate a major portion of his address in this booklet. Surely, we can have no better advocate of the Company Section idea than Mr. Doherty.

William S. Kline, Chicago: I have always been a very strong believer in Company Section work, and Mr. Doherty's talk tonight has been a great stimulant to my imagination as to the future possibilities of that work. Last night I had the same pleasure Mr. Doherty had of hearing Mr. Gordon's talk, and Mr. Doherty's suggestion of having lecturers go around to the different Company Sections brings the thought to me that it would be a wonderful thing if Mr. Gordon addressed a meeting of every Company Section and gave that same talk. I do not know of anything that would have a greater effect on the men than hearing that kind of an address.

I also think it would be a good thing if we had a copy of that talk sent to the publications of the different Company Sections so that it could be printed and circulated, but it would be even better if we could have Mr. Gordon go around to the different meetings.

H. W. Stevens, Boston: As I said this morning at the session, our Section has been up against the "Edison Club" which takes in all employees of the Boston Edison Company at a less expenditure of money than the N.E.L.A. dues. I have been president of the Company Section for two years. Immediately on my accession to office I was advised that all activities would cease, on account of the war, and it is only recently that we have received permission to go ahead.

We have had one meeting, and I attempted to start something a little different from what had been done before. I wanted to get the men to come in of their own will and show their interest in the Section by participating in the meetings. I told them that the presentation of papers at the Section meetings would help them to get along in the industry and also in the company, because if a man was always participating in discussions, some time when a department superintendent wished to make a promotion or fill a place he would say: "There is Bill Smith, he is always showing up at these meetings; he surely knows something, and I will give him a chance."

So far I have not received any intimation that my suggestion fell on fertile ground, and I have been in a quandary on this subject. I came over here hoping to get a little bit of inspiration and I have received some, also assurance from the Committee on Company Sections of aid in the future, which I think is going to help out a great deal. Mr. Doherty's talk tonight has been a kind of eye-opener to me. I have enjoyed it very much and shall take away with me a remembrance of it. I am quite sure before my term runs out our Section will show more signs of life.

ALBERT GOLDMAN, New York: It is a pleasure for me to be here tonight. I am thankful for having had the opportunity of hearing Mr. Doherty's interesting talk. His experience in the electrical field and in the handling of his many other interests enables him to quote facts, which I am sure will help us and for which we all join in thanking him.

As assistant general commercial manager of the Bronx District of the New York Edison Company, some years ago I was confronted with the problem of securing power business in a residential district. At about the same time the Bronx Board of Trade inaugurated a membership campaign. It occurred to me that by helping the Board it could in turn help me, and I devoted all my time to the work allotted to me by the Membership Committee and was instrumental in securing about one hundred new members. The total membership, I believe, was increased approximately one thousand. For this effort I was awarded the chairmanship of the then newly established Industrial Bureau.

I appeared at every meeting, and never failed to tell the Directors of the Board of Trade how lacking the community was from an industrial standpoint, considering what a wonderful community we had insofar as labor, land and railroad facilities were concerned.

Soon I found out I did not know as much about industries as I thought I did. I was only an amateur. I was then provided with an experienced industrial man who made a survey of the district, and with this help the Industrial Bureau succeeded in renting all available factory space, thereby bringing manufacturers and larger users of power to the community, and thus giving us the power load that my superiors desired me to get.

From what Mr. Doherty has said, the public invites us to render service and ofttimes we are neglectful of the opportunity presented. Mr. Doherty also mentions the benefits to be derived from the use of electrical apparatus in the factory, it being a medium for using labor and making the work more agreeable, at the same time bringing into the company a reasonable revenue.

The present officers of our Section sometime ago voiced their opinion that the Section meetings were not giving the results desired. We realized that there would have to be closer cooperation between the National body and the Sections; that is, the prevailing opinion was that there was not sufficient recognition by the National body of the local Sections and also that the local Sections apparently were not represented in the National body, which they should be. It was our thought that the men who were to serve on the various committees of the National body to stimulate the work of the Sections, should be selected from the personnel of the Sections. We drew up the following plan which we intended to submit to the National body, embodying the recommendation that the Section work be conducted by committees working in parallel with the Committees of the National Body, enabling the various Sections to derive the benefit of the work which one Section is doing and which could be localized into the activities of any of the Sections which chose to adopt it.

The plan which we drew up for the modification of the Company Section work was as follows:

"Object: We feel that the Company Section should always have in mind the object of the National Association, which is:

"To advance the art and science of the production, distribution and use of electricity for light, heat and power for public service.

"In the furtherance of this object its activities shall be largely educational and for the fullest development of the electrical engineering arts and sciences in all their branches.

"Organization: It is our belief that this object can best be attained by the following changes in organization and procedure:

"1. The division of the membership into two classes, ACTIVE and ASSOCIATE. The Active members would be privileged to do committee work and the Associate members would receive the National and Section Bulletins and be privileged to attend the annual meeting of the Section.

"2. The elimination of all general meetings with the exception of the annual meeting.

"3. The carrying on of the work of the Section through Committees approximately paralleling the National Committees and made up of Active member representatives of the companies comprising the Section. The duty of these committees would be to hold periodic meetings, to which all interested Active members would be invited and at which the work coming within the scope of the committees would be discussed. The committees would also keep in touch with their parallel national committees, exchanging whenever possible the conclusions resulting from their respective research work.

"The minutes of the meetings would be published in a monthly bulletin which should be a valuable contribution toward the advancement of the art."

H. B. LOHMEYER, Baltimore: I want to take this opportunity to express my appreciation of Mr. Doherty's splendid address, and I wish to convey to you gentlemen here assembled a message from the Accounting Section of the N.E.L.A. I have been for some years more or less actively engaged with the Company Section of the Baltimore Consolidated Gas, Electric Light and Power Company in the educational work, which has been a matter of considerable interest to me. One of the principal things that Mr. Doherty emphasized was the value of presenting to our employees an opportunity to improve their own education, to give them the facilities with which to increase their abilities and perfect themselves in whatever line of endeavor they were engaged.

At the Accounting session yesterday the report of the Committee on Accounting Education, of which I happen to be Chairman, was presented, the gist of which I would like to give here. To sum it up briefly, I will say that the advanced course in accounting has been practically completed. This is a course of thirty-six lessons covering public utility accounting in every phase. It is a little broader than a straight accounting course, and it could readily be called a course in business administration, finance and accounts. The general lessons of the course have been prepared by an accountant of ability, supervised by a board of sixteen authors and nine editors—some of the most prominent accountants in our industry. The special lectures on various subjects have been written by men who are representative of particular phases of accounting and business work in the various organizations.

Before the fall session, as you might call it, opens up, these lessons will be in print; the majority of them are in the hands of the printer now.

The thought I would like to convey to you gentlemen in going back to your companies is that I would like you to endorse these courses. I do not want you to make it a specific endorsement of the Accounting course, as the N.E.L.A. has three other courses, all of which are worthy of consideration by your employees, but what we desire is a general endorsement of this work.

As to the value of this course, it has been passed upon by some of our foremost accountants. One of those who endorsed it yesterday was Mr. H. M. Edwards of New York, whom a great many of you know to be one of the foremost accountants in our industry. Mr. Edwards stated in conclusion of his able remarks on that subject that every man in the electrical utility industry who completed the advanced accounting course of the Accounting Section, with a proper grading—in other words, completed it successfully—should be perfectly capable of conducting the accounting department of any public utility in the United States. I thank you.

JOSEPH B. SEAMAN, Philadelphia: I am connected with the Philadelphia Section. A great industrial engineer has said: "From the time the baby begins to walk and in falling learns caution, until death makes its claim, life is one gigantic school in which we are taught lessons that are eloquently, sometimes cruelly, illustrated." In our age we have learned when too late that the advice of our parents was the product of wisdom based on experience. Emerson said: "Experience is like a lamp on the stern end of a boat. It lights only the path over which it has passed."

Following the excellent advice so beautifully brought out in this excellent address of our Father in Company Section work let us give due regard to the past history of the Association and take advantage of this good advice in promoting our work in the future.

A man's knowledge is in a marked degree the measure of his responsibility. The tremendous importance and value of the excellent address of Mr. Doherty fixes upon each of us an obligation from which we will not escape. Let us go back to our various companies with the firm determination to convey to our fellow workmen this splendid spirit of optimism and the broad vision of Mr. Doherty's address. This is our obligation and it is our privilege. Let us carry the message to those with whom we are associated in this great industry.

You may have heard the story of the western ranchman who was riding with a tenderfoot. The countryman was amusing himself by using his blacksnake upon the leaves and the weeds of the roadside. The tenderfoot asked him if it was by accident or design that he cut down the flower and the leaf. The countryman said, "Pick out some object and let us see." The tenderfoot said "See that thistle," and almost instantly the crack of the ranchman's whip cut off the pink blossom of the thistle. On a little further the tenderfoot said "See that knotted leaf on yonder oak," and at the crack of the ranchman's whip the leaf fell. A little further on the tenderfoot pointed to a gray colored ball among the leaves, and requested the ranchman to test again his skill with the whip. The ranchman who was somewhat of a philosopher said: "Now, look a hyar stranger, that ayer thistle am a thistle, and that ayer leaf am a leaf, but that er hornet's nest am an organization." I think you see the point.

Let us go back to our organizations, whether they be Company Sections, departments or companies, keeping in mind that generally accepted definition of an organization, namely: "An organization is a harmonious group of human individuals directed towards a common end." We will then be able, in some measure, to carry out the splendid vision of Mr. Doherty's remarkable address, and if we encounter the traitor who would plant sedition in our ranks, whether he be a Bolshevik or what not, he will be discouraged at once, for he will recognize that he is not dealing with an individual unit, but with an organization.

William K. Kerford, Philadelphia: About a year ago I had the honor of being elected Chairman of the Philadelphia Section. Next week I will go out of office, but I do not hesitate to say that we have had the greatest section year in Philadelphia we have ever had. That has been brought about principally by the fact that I tried to figure out this problem: What can we give the employees of the company that will do the employees and the company the most good? In our effort to solve that problem, through our Educational Committee, we devised a plan of instructing the employees of the Philadelphia Electric Company. We laid out a course of twelve lectures. We took every department in the company and the relations of one department to another. We had this course of lectures for the purpose not only of helping the employee, but of helping the company as well, by instructing the employees so that when they went out among their friends and mingled with the public, and were asked anything about the company, they could give a satisfactory answer. I think the greatest advertising any company can secure is through its employees, and the higher the grade of its employees and the better they are informed regarding the affairs of the company, the more useful they can be in presenting the company in a satisfactory light to the public.

There was another obstacle to overcome, and that is the question of how much better is one man in the company who pays five dollars to join the Company Section of the N.E.L.A. than another man who does not pay that amount. To overcome that difficulty we devised quite a scheme of prize awards for Class B members, to which the Company Section members were eligible. That was the only way we could differentiate between the N.E.L.A. member and the employee who was not a member. Outside of that we treated all employees alike.

I had the pleasure of having Mr. Birch on our Executive Committee, and I made him the chairman of the committee on prize awards. He developed quite a scheme, whereby every member, if he wanted to work, could get back his dues. We did that in the way of points, twenty-five points secured a man a Thrift Stamp and four hundred points a War Savings Stamp, with the result that out of the seven hundred members we had in our Section this year there will be over three hundred who will receive prizes of some kind—anywhere from one dollar to a hundred and fifty dollars.

When I submitted the budget to Mr. McCall and he asked me how much money these prize awards would run into, it was pretty hard to figure out, as we could not tell how the men were going to work, and he said: "Well, where are you going to get this money?" I found out that last year we spent $2500 for printing. At that time we were putting out our monthly "Current News," and I think, like all of our Sections' monthly publications, "Current News" generally came out two weeks late, about the second week of the month, so that when the employees received their copies, they were reading things that happened four or five or six weeks previously. We decided we would change the publication to a four page weekly, and we printed thirty-one hundred copies every week, seeing to it that every employee had one every Monday morning. In this way we reduced the expense of our printing of this small edition of "Current News," and were able to save $1300 over the last year.

Next week, when we close our Section year, I think we will be able to turn back to Mr. McCall about $1000 of our budget; in other words, we will have run the Section for a thousand dollars less during the past year than it has cost for the last four or five years, and we have had a most successful year—the most successful year we have ever had.

The Chairman: Before we adjourn I want to exhibit for your inspection the New Company Section Charter, about which we spoke this morning in our report at the General and Executive Session. This is the only copy I was able to get before I left Philadelphia (exhibiting charter). We have had one hundred of these charters steel engraved, and as soon as we can conveniently do so we are going to have the names of the Sections engrossed in the space immediately over the seal. They will be sent to all active Company Sections, with a letter explaining the reason why, and then we are going to use them as an inducement to get some of the other Sections back in line. Hereafter, one of these charters will be given to each Section when it is organized.

Is there any further discussion?

Mr. Doherty: I want to say a word for the Public Policy

Committee and for the Executive Committee, especially for the Public Policy Committee because the members of that Committee are older men with whom I have worked for many years. I think there is rather a tendency on the part of the members of the Company Sections to be afraid of these men, and the officers of the Sections hesitate to say what is wanted by the Sections. There is not a man on the Public Policy Committee who is anything but reasonable and they are all approachable; they are busy men, but they are approachable if you will decide what you want and will take the responsibility of making a success of the Company Section without putting it up to the "big boss." That is what we have to do in our industrial life. If you will make up your minds you will accept the responsibility, and will constitute yourselves a body to run the Company Sections, you can call on me any time you want me to go with you to the Public Policy Committee or the Executive Committee with any matter relating to the welfare of the Sections. If you need money and will show a reasonable ground for having it, we will undertake to get it for you; and I do not think there will be any doubt but that you will get it. If you want lecturers, or whatever you want, if it is reasonable and if you will prepare in good shape a statement of your desires, I will always be ready to go with you to one of these committees and assist you in getting what you want.

What I want you men to appreciate is this: If you have not the initiative to go to these men, who already have so many things on their hands, and tell them exactly what you want to make a success of the Company Sections, we will not make a success of the Company Section work; while if you folks appreciate that the success of it depends upon you, and you take the necessary measures to secure the proper aid, we can make the work successful. One gentleman spoke of not being able to get the support of his company or words to that effect. You must sell yourselves and must convince your executives of the necessity of the work you are doing. That is what the advertising man has to do when he wants to get his appropriation. As far as the Executive Committee and the Public Policy Committees of the National Association are concerned, I do not think you have to sell yourselves there, but you have to show very definitely what you want.

You must figure that out for yourselves, and if you will do that I will always be ready to help you to get it through.

THE CHAIRMAN: I do not want to cut the meeting short but I suppose some of you gentlemen want to attend the reception.

If there is no other business, the meeting will stand adjourned.

(At this point the meeting adjourned.)

FOURTH GENERAL AND EXECUTIVE SESSION

Thursday, May 22, 1919

President Wells called the meeting to order at 10:10 o'clock.

THE PRESIDENT: Our first business this morning is the report of the Committee on Safety Rules and Accident Prevention. Part of it, the General Report, will be presented by Mr. William C. L. Eglin, of Philadelphia, Chairman. (Applause.)

REPORT OF COMMITTEE ON SAFETY RULES AND ACCIDENT PREVENTION

GENERAL STATEMENT

Accident prevention work, as in former years, has been practically entirely in the hands of a sub-committee, of which Mr. C. B. Scott is chairman, and of which work a separate report will be submitted by Mr. Scott. The main Committee has devoted its activities to work in connection with the Bureau of Standards and kindred matters, which work, in spite of the urgency of their routine duties during the past year, has exacted considerable thought and effort on the part of the members of your Committee.

RESUSCITATION

The Third Resuscitation Commission, whose organization and work were directed to your attention in last year's report, submitted its Proceedings and Resolutions late in 1918, which Proceedings and Resolutions were printed in the January, 1919, Bulletin of the Association. The Rules for Resuscitation from Electric Shock and the Resuscitation Chart, which is an abbreviated form of the Rules, have been revised by the Sub-Committee on Accident Prevention and will be treated more fully in Mr. Scott's report. Fifty thousand copies of the Booklet of Rules, which also contains the Proceedings of the Third Resuscitation Commission, and ten thousand copies of the Chart have been printed and are ready for distribution, and the endorsement and approval of the Association of this revision are requested at this meeting.

ACTIVITIES OF THE BUREAU OF STANDARDS

Early in August of last year the Bureau of Standards advised your Committee that it desired to revise the National Electrical Safety Code, due to the fact that the present edition was exhausted, and it was felt that the work could be materially improved in form and arrangement, and that certain revisions in the rules were also necessary. At the same time the Bureau submitted to the Committee a manuscript copy of the proposed revision of Part 2 "Rules for the Installation and Maintenance of

Electrical Supply and Signal Lines," and also sent throughout the country a considerable number of photostat copies of Part 3 covering Utilization Equipment.

It was pointed out to the Bureau very strongly that with the industries at the apex of their activities in connection with the great war, the duration of which at that time was very problematic, the time was extremely inopportune for consideration of any such questions; and that further, your Committee had agreed to the rules and regulations appearing in Circular 54 of the Bureau of Standards only for a trial period, during which period a study would be made of the operation under the Code rules and data relative to such operations be collected for future discussion and revision; that the situation confronting all utilities during and subsequent to the year 1917 has precluded the possibility of any real study of the existing Code being made, and that they were therefore not in position to discuss intelligently or make the necessary study which a revision of the Code would entail.

The Bureau felt, however, that inasmuch as the great majority of the changes were in arrangement and verbiage only, the revision should proceed, and, while we were unable to persuade the Bureau to postpone the revision, it has at least exhibited considerable patience. There have been a number of meetings of the Committee and many conferences bteween the Committee representatives and the Bureau, and practically all of the minor changes and the general arrangement of the rules have been thoroughly discussed by the Bureau of Standards' representatives and the Committee. There are certain fundamental changes in the rules, however, to which the Committee interposed strenuous objection without a thorough study of the conditions being made, and there will be a meeting of the Committee this afternoon, at which it is hoped to obtain a full attendance to discuss these changes and decide on a method of joint study in the field between the members or representatives of the Association and representatives of the Bureau of Standards. When a definite conclusion is reached on the points at issue at present, the Bureau of Standards will send photostat copies of the proposed revision of this section to a large number of our members for their final study and criticism prior to the Code being reprinted.

The Committee has not so far considered the changes in the other sections of the Code, which, it is understood, are of minor importance, but these matters will have the attention of the Committee before the Code is reprinted.

DEVELOPMENT OF INDUSTRIAL CODES BY THE BUREAU OF STANDARDS

In addition to its work on the National Electrical Safety Code, the Bureau of Standards called a conference in January to discuss the development by the Bureau of Safety Codes or Safety Standards of practically all industrial activities, in many of which the members of this Association would be very directly interested. This meeting was attended by representatives of many of the national associations, Government bureaus, State commissions, and municipal departments, and, while considerable opposition was exhibited to the Bureau developing these Codes, the greater part of the discussion centered on the two plans of procedure outlined. Plan "A" involved the appointment by the Bureau of a committee of some fifty representatives of associations and other bodies interested, to cooperate with it in the development of these Codes; and plan "B" involved the development of the Code through the machinery of the recently formed American Engineering Standards Committee.

A committee was finally appointed to draw up the proposed plans and submit them to all interested associations and other bodies for a vote as to the method to be followed. This report and ballot sheet are now in the hands of your Association for action. Under the plan proposed the American Standards Committee would be enlarged, would be known as the American Standards Association, and would include in its membership all associations and other bodies interested in the development of safety or other standards. This would result in the formation of a body very similar to the British Standards Association and would apparently provide the machinery for the production of such Codes as are necessary and of a character satisfactory to all parties in interest.

As our industry expands it is but natural to expect the proposal and passage of laws and other measures of a regulative character, and the Association must no doubt prepare to meet problems of this character for many years to come. The industry is, to a certain extent, handicapped in this connection in that it is not centrally organized, so to speak, and it is extremely difficult to obtain authoritative and representative expressions of opinion from a membership of the number and covering the area represented by this Association. It is therefore felt that much of the work performed by your Committee, which might be considered routine work, involving, as it does, a vast amount of correspondence, tabulation, investigation and study, should be conducted in some manner by direct representatives of the Association whose entire time could be devoted to the questions at issue.

I wish at this time to express my thanks to Mr. C. B. Scott for the large amount of work he has done as Chairman of the Sub-Committee on Accident Prevention; and also to Mr. P. H. Bartlett, who really acted as Chairman of this Committee during the war period, and who is responsible, with the assistance of Mr. Thomas Sproule and Mr. S. G. Rhodes, for the success of the work during this period. (Applause.)

THE PRESIDENT: We will now call for the report of the Sub-Committee on Accident Prevention, which will be presented by Mr. Charles B. Scott, of Chicago. (Applause.)

REPORT OF THE SUB-COMMITTEE ON ACCIDENT PREVENTION

FOREWORD

NOTE: In compliance with the general request of the Executive Committee of the Association this report is brief and with a minimum of illustrations.

The Report of Progress of the Sub-Committee on Accident Prevention which was presented at the Forty-first Annual Convention of the Association contained but few definite suggestions for the future activities of this Sub-Committee for the reason that with the submission of the Report of Progress final conclusions and recommendations were submitted covering much of the former continuing program. Your 1918-1919 Sub-Committee has therefore largely centered its attention upon problems brought to its notice during the past year by member companies of the Association or by the individual members of this Sub-Committee.

Your Sub-Committee believes the present attitude of industries in general toward the subject of accident prevention as compared with that of two years ago and the other present industrial conditions resulting from the war fully justify its consideration of such relating subjects as "Employees' Relations" and "Educational and Publicity Methods" and is confident the Association will approve of such consideration as is presented in this report and recommended for future attention.

At a meeting held December 5 and 6, 1918, the following program was adopted for the guidance of this Sub-Committee, viz.:

1. Revision of the booklet, "Rules for Resuscitation from Electric Shock," so as to conform with the report of the Third Resuscitation Commission.
2. Revision of the chart, "Resuscitation from Electric Shock," so as to conform with the report of the Third Resuscitation Commission.
3. Completion of the Sub-Committee's tentative recommended specification for Linemen's Belts.
4. Presentation to the Association of recommended "Educational and Publicity Methods for Accident Preven-

tion," including such instructions and suggestions as should assist in establishing a more thorough general policy for the prevention of accidents in the electrical industry.

The procedure and findings in accordance with this program are hereafter detailed in this report.

NECESSITY FOR MORE ACTIVE INTEREST IN ACCIDENT PREVENTION

We quote from the 1916 Report of the Accident Prevention Committee:

"There is no question as to the practicability and effectiveness of the accident prevention movement. Many of the members have made a careful study of this work and have put into practice carefully developed and systematic plans, by which they have brought about a reduction in the number of accidents of from thirty to fifty per cent, and a still larger reduction in the percentage of fatal accidents to employees. It should no longer be necessary to devote time and energy to trying to convince men, particularly the men represented by the membership of this Association, that they should be engaged in carrying on a work of such vital importance to their companies and to the communities served. In the opinion of your Committee, earnest efforts and practical methods for the prevention of accidents to the public and to the employees of the companies constitute one of the surest means of establishing a better relationship between the companies and the public. In addition to the benefits which directly accrue to the public service companies, far reaching effects are reflected in the public good, which is very desirable, not only from the viewpoint of the management, but also from the viewpoint of a more desirable and better citizenship and consequent better civic conditions. It is the earnest desire of this Committee that those members who have not yet availed themselves of the benefits of accident prevention work, will give this matter their prompt attention and immediately put into practice a definite plan of accident prevention, so that they may no longer be under the suspicion of being indifferent."

It has been the custom in previous reports to make such urgent appeals to members who have been indifferent or negligent in carrying on a well organized effort for accident prevention, and even now after these repeated appeals there exists in many locations a lack of appreciation and a consequent apathy which compel us to continue our efforts for a proper recognition of the importance of this subject and a more business-like adoption of reasonable plans for the reduction of accidents and accident costs.

Previous reports have included detailed explanations of plans for safety organizations, the procedure to be followed in arranging and instructing committees and groups of employees, recommendations as to the frequency and character of safety meetings, forms of constitution, by-laws, etc.

Your present Sub-Committee has gone a step further and herein presents a "Report on Educational and Publicity Methods" based upon the following requirements and outline:

1st—Definite plans for greater interest by the membership in accident prevention.

2nd—A plan by which the Sub-Committee on Accident Prevention could be of greater service to the membership as a clearing house for information and suggestions for elimination of accidents in the electrical industry, a plan which would insure closer contact between the membership and this Sub-Committee.

3rd—Recommendations to the members of the Association of definite plans for enlisting the interest of the public served and thus decreasing public accidents in connection with the operation of properties.

With these points in mind the following Report on Educational and Publicity Methods was prepared and approved by the Sub-Committee and is herewith submitted for your endorsement:

REPORT ON EDUCATIONAL AND PUBLICITY METHODS

The Sub-Committee on Accident Prevention respectfully submits the following recommendations on educational and publicity methods, designed for the extension of a more thorough understanding of the firm foundation upon which the movement has been established and the imparting of information as to the rapid progress which is being made today, to the end that the exchange of our common experiences may prevent expensive duplication of work and the repetition of methods which past experience has condemned.

I. It is recommended that each utility having a sufficient number of employees to warrant the expense, each group of utilities which can be co-operatively organized for the purpose, and each operating syndicate, employ a supervisor who should devote his entire time to accident prevention work.

II. For the purpose of assisting the supervisors now employed by the different utilities, or who may hereafter be employed, and also to assist the member companies that desire such service, it is suggested that negotiations be entered into with qualified agencies and engineers to supply such help as may be required by the members of the Association. There are such agencies and engineers already in existence who it is believed can render such service. The most successful prosecution of accident prevention work requires the advice of experienced specialists or engineers whom some utilities are not in position to employ constantly.

It is understood that these services, if obtainable, would be rendered at a pre-determined standard price for each service, at such cost to the utility as conditions may dictate, and be so arranged that any utility may avail itself of such services to the extent desired. It is believed, however, that the aforesaid agencies should be prepared to render a full standardized Accident Prevention service to such utilities as may desire to pay for it, and without any expense to the Association, which will, however, maintain on file a list of the organizations and experienced engineers whose services would be available under this arrangement.

III. It is recommended that the member companies freely avail themselves of the services of this Sub-Committee whose advice is always at their disposal, that they regard this Sub-Committee as a clearing house and an advisory body, and that its proceedings and publications be purchased and placed in the hands of every employee who can use them.

IV. It is recommended that Association utilities participate in such public accident prevention movements as may be organized in their communities with one of the objects in view of helping to guide these movements into sane and reasonable channels.

V. The following outline for accident prevention work is submitted for the consideration of member companies contemplating the enlargement of their educational program:

A—PRELIMINARY WORK.

1—ANALYSIS OF ACCIDENT REPORTS.
    Probable Causes
    Physical Factors
    Human Factors
    Means of Prevention
    Physical Changes
    Changes in Methods of Working
    Needed Instruction of Men

2—INSPECTION OF PROPERTIES.
    Tabulation of conditions producing risks of fire—from inside or outside sources.
    Accidents to employees, or public equipment.
    Break-downs of equipment due to excessive wear, etc.
    Interruptions to service.

3—STUDY OF OPERATING METHODS.
    Tabulation of those methods involving risks of fire—from overloads, lightning, etc.
    Accidents to employees, or public equipment.
    Break-downs of equipment due to overloads, etc.
    Interruptions to service due to lack of skill or instructions of men, etc.

4—RECOMMENDATIONS FOR REMOVAL OF RISKS.
    Changes in conditions and methods.

5—DEVELOPMENT OF SAFETY STANDARDS FOR:
    Designs of all equipment and structures.
    Methods of doing construction work.
    Methods and rules for operating plants, lines, cars, etc.
    Methods and scope of periodic inspection of equipment.
    First Aid and Fire Fighting Equipment, their extent and location and provision for their maintenance.

Accident investigations to get at probable causes and possible means of prevention.

B—CORRECTION OF DEFECTS.

1—Approve designs for changes recommended.
2—Provide data for development of safety standards.
3—Follow up progress of correction work.

C—SAFETY EDUCATION OF ALL EMPLOYEES.

1—ACCIDENT RECORD.
- Talks and graphic charts on number and kind of accidents.
- Talks and illustrations on various causes and effects of accidents.

2—SAFETY TO MEN AND EQUIPMENT.
- Periodic talks, charts and object lessons on why and how safety is secured.
- Committee inspections and conferences on unsafe conditions and practices.
- Distribution of printed matter.
- Pay envelope slips.
- Calendars.
- Bulletin boards.
- Company periodicals.

3—FIRST AID INSTRUCTION.
- Talks and demonstrations by experts.
- Practice by all men.
- Contests and conferences.

4—SAFETY EDUCATION OF NEW MEN.
- Safety principles.
- Safety Standards.
- First Aid.

D—PUBLIC SAFETY EDUCATION—in cooperation with others interested in any phase of the subject.

1—GENERAL PUBLIC.
- Newspapers—interest editors.
- Movies—get safety reels for theatres.
- Public meetings and contests.

2—CHILDREN IN SCHOOLS.

- Illustrated talks.
- Safety story books.
- Calendars for schools and homes.
- Book markers and blotters.
- Safety scout patrols.
- Safety games for all seasons.

EMPLOYEES' RELATIONS

In dealing with the question of prevention of accidents, your Sub-Committee has been brought in touch with that most important problem of employee relations. This is most natural, in that the human element is the most important factor to be dealt with in preventing accidents. In the past, the Association has received reports in connection with some of the efforts to solve the problem of employee relations. This action was sufficient for the time at which the reports were received, but it is felt that the war and efforts put forward for its victorious conclusion have changed to a very large extent the viewpoints of employer and employed.

Some evidence of this can be seen in the reports of the Whitley Committee on Industrial Councils of Great Britain, the Royal Commission of Inquiry into Industrial Relations in Canada, the Industrial Council Plans of the steel companies, a large oil company, implement companies, etc., in the United States. These plans and investigations are all tending to a greater recognition of the human factor in industry. Most of the plans grant features that will make for more happiness among the employees and also will require from the employees more interest in the industry. To sum up, they endeavor to obtain cooperation between employer and employed for their mutual benefit, replacing fear with confidence.

No plan is such that it can be applied universally. The utility considering the situation will do well to investigate very carefully the fundamentals underlying the situation to make sure that the plan put in force will meet its requirements. In other words, apply to the human side of the industry the careful study that is being applied to the material side. A pension scheme, sick benefit, employees' association, profit sharing or industrial council should be as carefully designed and fundamentally sound as a large power plant or other engineering problem.

Realizing this and appreciating the present need for a thorough study of this most important problem, and taking into consideration the close relation between the work of accident prevention which you have delegated to us and this newer problem, your Sub-Committee presented the following letter to the Chairman of the Committee on Safety Rules and Accident Prevention:

"Mr. W. C. L. Eglin, Chairman,
"Committee on Safety Rules and Accident Prevention,
"National Electric Light Association,
"Philadelphia, Pa.

"Dear Mr. Eglin:

"The loyalty, health, welfare and efficiency of the employees of any company are of very vital interest to the officers of the company. This is much more evident in a public utility where continuity of service is almost a deity and where a large percentage of the employees are in touch with the public. By these employees the utility is often judged by the public.

"In the past many schemes have been tried with more or less success, such as pension, sick benefits, prevention of accidents, athletic associations, employees' clubs, sale of stock to employees and educational courses. These have all tried to make the company's service attractive to the desirable type of employee.

"At present the employees, together with all mankind, have come through a period where old established ideas have been broken down and new ideas are now being set up. There are many plans being set forward for the creation of these ideas, some of a very radical nature.

"Most executives are very carefully considering and studying the situation and are formulating plans. They find in general that it is an extremely difficult path to follow, as much is pioneer work, and authentic data are very difficult to obtain, particularly those applying to the utility field.

"The public utility company for the most part is in a different position from the manufacturer. Its employees are scattered over a large area, being in small groups, whereas those of the manufacturer are located in much larger groups. The basic principles underlying the solution of their employee problems may be the same but the application is for the most part vastly different.

"The N.E.L.A. has a great responsibility to perform and is capable of rendering a most valuable service. It is looked upon as representing the best studied thought of the electrical public utility industry. In the past it has been studying material things for the most part. Its committees on such matters as meters, electrical apparatus, rate research and commercial interests have set a high standard. It has also been dealing with educational matters, accident prevention and other matters pertaining to the employee.

"What more natural than that in these times of change it should have committees studying those most important non-material questions of employee relations. Upon these relations has often depended the success or failure of an organization, and with this in view, many schemes to improve them have been tried out and much money expended. Is this money expended in the best way or would increases in salaries have just as beneficial results as pensions and sick benefits? If the beneficiary schemes are best, in what way can they best be carried out? How best can the new employee be trained into a valued employee? Should he be left to sink or swim or should a studied method of training be put into effect? If put into effect, how can it be best adapted to a company whose employees are in small groups? These, among other very important problems, demand careful and immediate attention.

"We are dealing with lives, not lamps; with men, not motors; with the development of brains, not powers; and with that most valuable asset any company can have, a loyal, efficient and enthusiastic staff, surely a thing not to be allowed to chance to decide, but to be studied."

"Very truly yours,

"SUB-COMMITTEE ON ACCIDENT PREVENTION."

The consideration of this subject led to the adoption of the following resolutions which, together with the above letter, were sent to the Chairman of the Committee on Safety Rules and Accident Prevention for transmission to the Executive Committee or Public Policy Committee:

> INASMUCH as the present social and industrial conditions are in a state of flux, and
>
> INASMUCH as these conditions are receiving world-wide consideration, and
>
> INASMUCH as there is a dearth of information as to employee relations and so-called welfare work in public utilities, and
>
> INASMUCH as the problems thus presented to public utility companies are in so many cases different from those presented to manufacturing concerns, and
>
> INASMUCH as the careful and proper development of pension plans, savings plans and other beneficial and economic plans in the interest of employees have a considerable bearing upon these problems, and
>
> INASMUCH as accident prevention work is related to the other employee problems,
>
> BE IT THEREFORE RESOLVED, that the Sub-Committee on Accident Prevention of the Committee on Safety Rules and Accident Prevention respectfully recommends to the Executive Committee of the N.E.L.A. that a committee or committees be designated or appointed to study closely and report upon employee relations and conditions of labor in member companies so as to make available to the executive officers of these companies authentic data pertaining to these problems.
>
> BE IT FURTHER RESOLVED, that the Sub-Committee on Accident Prevention would respectfully suggest that if it is not hereafter so designated or delegated to make said study and report or its functions so enlarged, it will give to the committee or committees so appointed any possible assistance.

LINEMEN'S RUBBER GLOVES AND LINEMEN'S BELTS

The contemplated program for the present Sub-Committee included the completion of its tentative specifications for purchase, testing and care of rubber gloves for service on high tension apparatus on circuits not exceeding 3000 volts to ground, and also of its tentative specifications for linemen's belts. The proper tryout of the Sub-Committee's respective and tentative specifications has been impossible under the new industrial conditions brought about by the war and prevailing since its last report. Scarcity of materials, difficulties confronting members in following up constructive, helpful and usual practices and policies, and the generally disturbed industrial conditions made the two-year tryout period of no practical benefit to us. Your Sub-Committee has not received solicited reports and suggestions on these matters from the member companies. Nor have the members had the desired opportunities to demonstrate to themselves the value of our suggestions. With the expectation of later arriving at and promulgating final and more meritorious recommendations, your Sub-Committee herein repeats its former request for cooperation and for constructive criticism from the membership.

Your Sub-Committee recommends that member companies supply to their men standard linemen's belts.

Attention is called to a typographical error on page 419 of the 1918 Report of Progress. The heading on this page should read: "Specifications Recommended for the Purchase, Testing and Care of Rubber Gloves for Service on High Tension Apparatus on Circuits Not Exceeding 3000 Volts to Ground."

RESUSCITATION FROM ELECTRICAL SHOCK

Based upon the proceedings and resolutions of the Third Resuscitation Commission your Sub-Committee on Accident Prevention has prepared and submits herewith for your approval revised rules for Resuscitation from Electrical Shock by the Prone Pressure Method. It is recommended that the amplified rules be published in booklet form and copyrighted and distributed by the Association. It is also recommended that the condensed rules herewith presented be copyrighted, published and distributed by the Association in Chart form.

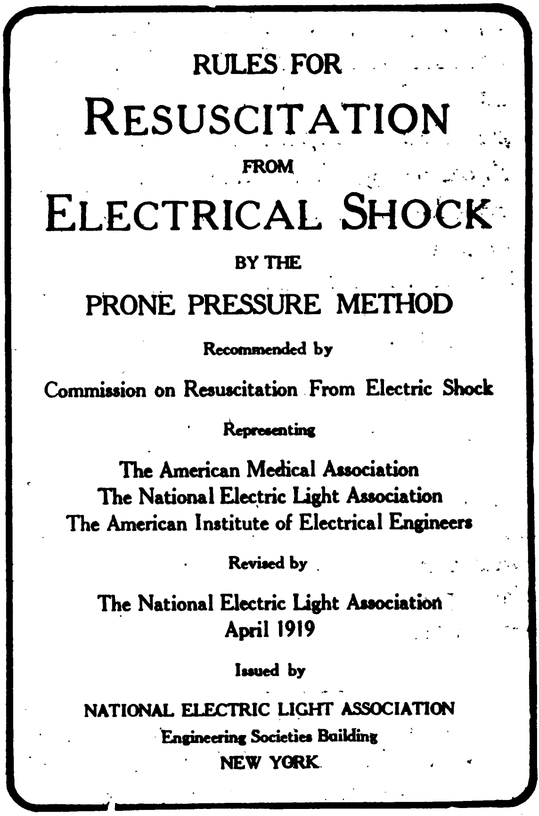
The recommended rules herewith presented differ from those heretofore adopted and promulgated by the Association as follows:

1. Details are given in the revised rules for the exact posi-

tion of the operator's hands, the thumb being placed alongside the fingers to prevent the operator from bending his elbows, the little fingers being placed on the lowest rib so that the hand will be in the most effective position.

2. The former rules provided that both arms of the patient should be extended over the head. The revised rules provide that one arm shall be bent at the elbow with the face resting on the forearm so that the nose and mouth are free for breathing.

The amplified rules (or booklet), the condensed rules (or chart) and the Proceedings and Resolutions of the Third Resuscitation Commission, upon which these rules are based, are as follows:



RULES FOR
RESUSCITATION
FROM
ELECTRICAL SHOCK
BY THE
PRONE PRESSURE METHOD

Recommended by

Commission on Resuscitation From Electric Shock

Representing

The American Medical Association
The National Electric Light Association
The American Institute of Electrical Engineers

Revised by

The National Electric Light Association
April 1919

Issued by

NATIONAL ELECTRIC LIGHT ASSOCIATION
Engineering Societies Building
NEW YORK

TITLE PAGE OF BOOKLET

PUBLIC UTILITY COMPANIES ARE URGED TO GIVE FREQUENT PRACTICAL INSTRUCTIONS AND DEMONSTRATIONS ON THE USE OF THESE RULES AND TO REQUIRE SUPERINTENDENTS, FOREMEN OR OTHERS HAVING CHARGE OF MEN, TO BE RESPONSIBLE FOR THE REGULAR PRACTICE OF THE METHOD BY ALL EMPLOYEES. IT IS FURTHER RECOMMENDED THAT THESE PRACTICE MEETINGS BE HELD MONTHLY AND THAT A RECORD BE KEPT OF THE ATTENDANCE.

The prone-pressure method of artificial respiration is equally applicable to resuscitation from electrical shock as well as all cases of suspended respiration due to drowning, inhalation of gas, smoke or fumes, or to other causes.

INSIDE FRONT COVER OF BOOKLET

3. The newly revised rules provide (under Part II, paragraph 5) that in swinging backward the pressure be *completely* removed, and, as illustrated by Fig. 3, this is accomplished by removing the hands from the victim's body.

4. Additional instructions are included for the guidance of an assistant to whom it is recommended that ammonia be placed near the victim's nose and that his heels be struck about twenty (20) times with a stick or tool, while resuscitation is being continued, this last operation to be repeated every five minutes until breathing commences.

PREFACE

The First Commission on Resuscitation from Electric Shock, consisting of the members listed below, was organized during the year 1911 to consider the problems presented in resuscitation and in the determination of the best manual method of artificial respiration that could instantly be applied by laymen. Their report unqualifiedly recommended the Prone Pressure Method.

PERSONNEL OF THE FIRST COMMISSION

DR W B CANNON, Chairman
Professor of Physiology, Harvard University
DR GEORGE W CRILE
Professor of Surgery, Western Reserve University
DR YANDELL HENDERSON
Professor of Physiology, Yale University
DR S J MELTZER
Head of Department of Physiology and Pharmacology, Rockefeller Institute for Medical Research
DR EDWARD ANTHONY SPITZKA
Director and Professor of General Anatomy, Daniel Baugh Institute of Anatomy, Jefferson Medical College
MR W C L EGLIN
Past-President, National Electric Light Association
DR A E KENNELLY
Professor of Electrical Engineering, Harvard University
DR ELIHU THOMSON
Electrician, General Electric Company
MR W D WEAVER, Secretary
Editor Electrical World

The Rules for Resuscitation from Electric Shock, which were based on the findings of this Commission and were printed and distributed by the National Electric Light Association, have been widely used and have, judging by the evidence presented, adequately fulfilled the purpose for which they were produced.

Certain questions respecting the method and the use of artificial respiratory and auxiliary apparatus have, however, arisen since the Rules were originally issued in 1912, and it was deemed advisable to organize a Third Resuscitation Commission to review the work accomplished and to make such further recommendations as the Commission might consider would be helpful. The personnel and proceedings and resolutions of this Commission are printed in this booklet and will be found on page 20, and the study of the proceedings and the application of the resolutions by whom and whenever possible is urged in the interest of life conservation.

Upon receipt of the proceedings and resolutions of the Commission, the Sub-Committee on Accident Prevention, consisting of Mr. Charles B. Scott, Chairman, and Messrs. Magnus Alexander, R. L. Baker, P. H. Bartlett, H. J. Burton, H. B. Harmer, Wills Maclachlan and W. T. Morrison, was requested to undertake the revision of the Rules for Resuscitation, which has been done with the thoroughness characteristic of the work of this Committee.

The revision of the Rules and also the Chart, which consists of an abbreviated form of these rules, has been based on field experience covering a number of years; and while no very radical changes have resulted, changes in detail have been made, which, it is felt, will make the operation of the method more effective, and to which the careful attention of instructors and those familiar with the method is directed.

(Signed) W. C. L. Eglin,
Chairman Committee on Safety Rules and Accident Prevention, N. E. L. A.

TREATMENT FOR ELECTRICAL SHOCK

An accidental electrical shock usually does not kill at once, but may only stun the victim and for a while stop the breathing.

The shock is not likely to be immediately fatal, because:

(*a*) The conductors may make only a brief and imperfect contact with the body.

(*b*) The skin, unless it is damp with perspiration or wet, offers some resistance to the current.

The life of the victim depends upon the prompt and continued use of artificial respiration. The reasons for this are:

(*a*) The body continuously depends on an exchange of air, as shown by the fact that we must breathe in and out about fifteen times a minute.

(*b*) If the body is not thus repeatedly supplied with air, suffocation occurs.

(c) Persons whose breathing has been stopped by electrical shock have been reported restored after artificial respiration has been continued for approximately four hours, and the treatment should be continuously applied until rigor mortis (stiffening of the body due to death) sets in.

The Schäfer, or "prone pressure" method of artificial respiration, slightly modified, is illustrated and described in the following resuscitation rules. The advantages of this method are:

(*a*) It is immediately available.

(*b*) Easy performance; no apparatus and little muscular exertion required.

(*c*) Larger ventilation of the lungs than by the supine method.

(*d*) Simplicity, the operator makes no complex motions and readily learns the method.

(*e*) No trouble from the tongue falling back into the air passage. The first impulse is expiration and any foreign substance in the mouth or air passage will likely be expelled.

(*f*) No risk of injury to the liver or ribs if the method is executed with proper care.

Aid can be rendered best by one who has studied the rules and has learned them by practice on a volunteer subject.

INSTRUCTIONS FOR RESUSCITATION

Follow These Instructions Even if Victim Appears Dead

1—FREE THE VICTIM FROM THE CIRCUIT IMMEDIATELY.

1. Quickly release the victim from the current, being very careful to avoid receiving a shock. Use any dry non-conductor (rubber gloves, clothing, wood, rope, etc.) to move either the victim or the conductor. Beware of using metal or any moist material. If both of the victim's hands are grasping live conductors endeavor to free them one at a time. If necessary shut off current.

Begin at once to get the subject to breathe (resuscitation) for a moment of delay is serious. Use "Prone Pressure Method" for four (4) hours if necessary, or until a doctor has advised that rigor mortis has set in.

Observe the following precautions:

(*a*) The victim's loose clothing, if dry, may be used to pull him away; do not touch the soles or heels of his shoes while he remains in contact—the nails are dangerous. If this is impossible, use rubber gloves, a dry coat, a dry rope, a dry stick or board, or any other *dry non-conductor* to move either the victim or the conductor, so as to break the electrical contact.

(*b*) If the bare skin of the victim must be touched by your hands, be sure to cover them with rubber gloves, mackintosh, rubber sheeting or dry cloth; or stand on a dry board or on some other dry insulating surface. If possible, use only *one* hand.

If the man receives a shock while on a pole, first see that his belt is secure around the pole, if possible above cross arm so victim will not fall, then break the current. Pass a hand-line under his arms, preferably through his body belt, securely knot it, and pass the end of the line over the first cross arm above the victim. If you are alone, pass the line once around this cross arm. If you are not alone, drop the line to those at the base of the pole. As soon as the rope is taut, free the victim's safety belt and spurs and descend the pole, guiding the victim. When the victim is about three feet from the ground, lower rapidly so that the victim's feet hit the ground hard.

2. Open the nearest switch, if that is the quickest way to break the circuit.

3. If necessary to cut a live wire, use an ax or a hatchet with a dry wooden handle, turning your face away to protect it from electrical flash.

II—ATTEND INSTANTLY TO VICTIM'S BREATHING

1. As soon as the victim is clear of the live conductor, quickly feel with your finger in his mouth and throat and remove any foreign body (tobacco, false teeth, etc.). If the mouth is tight shut, pay no attention to the above-mentioned instructions until later, but immediately begin resuscitation. The patient will breathe through his nose and after resuscitation has been carried on a short time, the jaws will probably relax, and any foreign substance in the mouth can then be removed. Do not stop to loosen the patient's clothing; *every moment of delay is serious.*

2. Lay the patient on his belly, one arm extended directly overhead, the other arm bent at elbow and with the face resting on hand or forearm so that the nose and mouth are free for breathing. (See Fig. 1.)

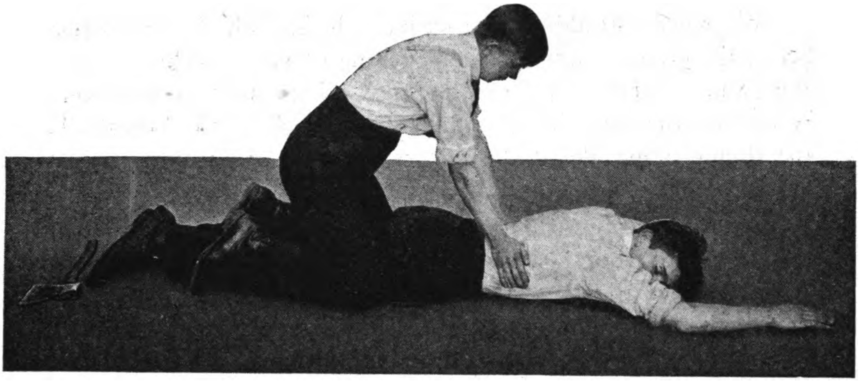


Fig. 1

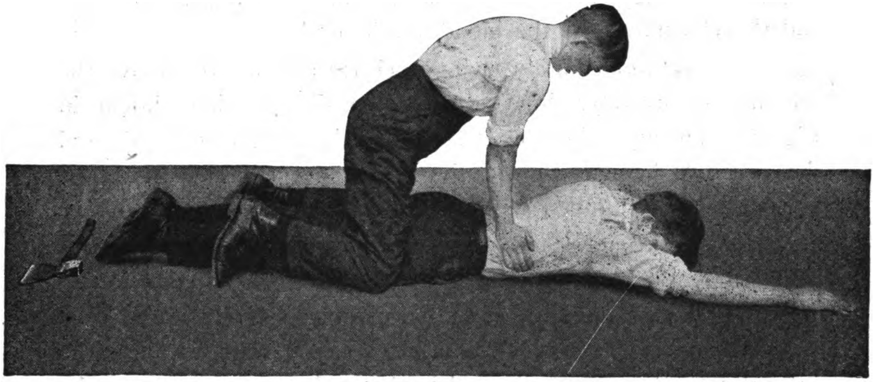


Fig. 2

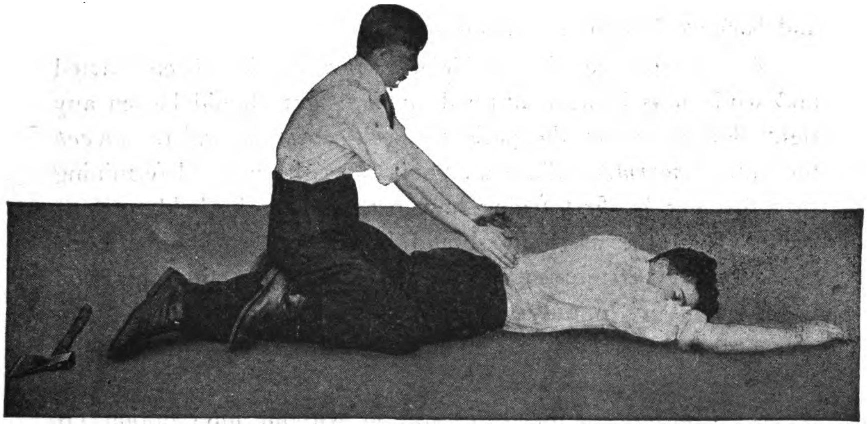


Fig. 3

3. Kneel, straddling the patient's hips, with the knees just below the patient's hip bones or opening of pants pockets. Place the palms of the hands on the small of the back with fingers resting on the ribs, the little finger just touching the lowest rib, the thumb alongside of the fingers, the tips of the fingers just out of sight. (See Fig. 1.)

4. With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the subject. (See Fig. 2.) This operation, which should take from two to three seconds, *must not be violent*—internal organs may be injured. The lower part of the chest and also the abdomen are thus compressed, and air is forced out of the lungs, the diaphragm is kept in natural motion, other organs are massaged and the circulation of the blood accelerated.

5. Now *immediately* swing backward so as to remove the pressure completely, thus returning to the position shown in Fig. 3. Through their elasticity, the chest walls expand, and the pressure being removed the diaphragm descends, and the lungs are thus supplied with fresh air.

6. After two seconds swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release—a complete respiration in four or five seconds. If a watch or a clock is not visible, follow the natural rate of your own deep breathing, the proper rate may be determined by counting—swinging forward with each expiration and backward with each inspiration.

7. As soon as this artificial respiration has been started and while it is being continued, an assistant should loosen any tight clothing about the patient's neck, chest or waist. (*Keep the patient warm.*) Place ammonia near the nose, determining safe distance by first trying how near it may be held to your own. Then the assistant should hit the patient's shoe heels about twenty (20) times with a stick, and repeat this operation about every five minutes, until breathing commences. Do not give any liquids whatever by mouth until the patient is fully conscious.

8. Continue artificial respiration without interruption (if

necessary for four hours) until natural breathing is restored. Cases are on record of success after three and one-half hours of effort. The ordinary tests for death are not conclusive in cases of electric shock and doctors must be so advised by *you,* if necessary.

9. When the patient revives, he should be kept prone (lying down)—and not allowed to get up or be raised under any consideration unless on the advice of a doctor. If the doctor has not arrived by the time the patient has revived, he should be given some stimulant, such as one teaspoonful of aromatic spirits of ammonia in a small glass of water, or a drink of hot ginger tea or coffee.

The patient should then have any other injuries attended to and be kept warm, being placed in the most comfortable position.

10. Resuscitation should be carried on at the nearest possible point to where the patient received his injuries. He should not be moved from this point until he is breathing normally of his own volition, and then moved only in a lying position. Should it be necessary, due to extreme weather conditions, etc., to move the patient before he is breathing normally, he should be kept in a prone position and placed upon a hard surface (door or shutter) or on the floor of a conveyance, resuscitation being carried on during the time that he is being moved.

11. A brief return of spontaneous respiration is not a certain indication for terminating the treatment. Not infrequently the patient, after a temporary recovery of respiration, stops breathing again. The patient must be watched, and if normal breathing stops, artificial respiration should be resumed at once.

III—Send for a Doctor

If other persons are present when an accident occurs, send one of them for a doctor without a moment's delay. If alone with the patient, do not neglect the immediate and continued resuscitation of the patient for at least one hour before calling a doctor to assist in further resuscitation efforts.

A published, up-to-date list of doctors posted by the company is recommended.

IV—First Care of Burns

When natural respiration has been restored, burns, if serious, should be immediately attended to while waiting for the doctor to arrive.

A raw or blistered surface should be protected from the air. If clothing sticks, do not peel it off—cut around it. The adherent cloth, or a dressing of cotton or other soft material applied to the burned surface should be saturated with picric acid (0.5 per cent). If this is not at hand, use a solution of baking soda (one teaspoonful to a pint of water), or the wound may be coated with a paste of flour and water, or it may be protected with vaseline, carron oil, olive oil, castor oil or machine oil, if clean. Cover the dressing with cotton, gauze, lint, clean waste, clean handkerchief, or other soft cloth, held tightly in place by a bandage.

The same coverings should be lightly bandaged over a dry, charred burn, but without wetting the burned region or applying oil to it.

Do not open blisters.

RESUSCITATION FROM ELECTRICAL SHOCK BY THE PRONE PRESSURE METHOD

Recommended by

NATIONAL ELECTRIC LIGHT ASSOCIATION

Note.—This chart is an abbreviation of the booklet of Rules for Resuscitation from Electrical Shock issued and distributed by the National Electric Light Association, Engineering Societies Building, New York. (Copyright, 1919.)

Permission to Reprint will be Granted on Application.

Follow These Instructions Even if Victim Appears Dead.

I—Free the Victim from the Circuit Immediately

Quickly *release victim* from current, being careful to *avoid* receiving *a shock. Use* any *dry non-conductor* (rubber gloves, clothing, rope, board) to move either the victim or the conductor. Beware of using metal or any moist material. If necessary, *shut off the current.*

II—Instantly Attend to the Victim's Breathing

1. As soon as the victim is clear of the conductor rapidly feel with your finger *in his mouth* and throat and remove any

foreign body (tobacco, false teeth, etc.). If mouth is *tight shut, pay no more attention* to it until later. Do not stop to loosen the patient's clothing, but *immediately begin actual resuscitation. Every moment of delay is serious.* Proceed as follows:

(*a*) Lay the *patient on his belly,* one *arm* directly *extended* overhead, the other bent at elbow and with *face to one side,* resting on the hand or forearm, so that the nose and mouth are free for breathing. (See Fig. 1.)

(b) *Kneel straddling the patient's hips* with knees just below the patient's hip bones or opening of pants pockets; place the *palms* of your hands *on* the *small of the back,* with the fingers spread over the lowest ribs, the *little finger* just *touching* the lowest rib, the thumb alongside of your fingers; tips of fingers just out of your sight, as in Fig. 1.

(*c*) While counting one, two, and with *arms* held *straight, swing forward* slowly so that the weight of your body is gradually but *not violently* brought to bear upon the patient. (See Fig. 2.) This act should take from two to three seconds.

(*d*) While counting three, immediately *swing backward* so as to remove the pressure, thus returning to the position shown in Fig. 3.

(*e*) While counting four, five—*rest.*

(*f*) *Repeat deliberately* twelve to fifteen times a minute the swinging forward and backward—a complete respiration in four or five seconds. *Time with your breathing.*

(*g*) As soon as this artificial respiration has been started, and while it is being continued, an *assistant* should *loosen* any *tight clothing* about the patient's neck, chest or waist. *Keep patient warm.*

2. *Continue resuscitation* (if necessary *four hours* or longer) *without interruption,* until natural breathing is restored. or until a physician declares rigor mortis (stiffening of the body) has set in. If natural breathing stops after being restored, use resuscitation again.

3. *Do not give any liquid by mouth until the patient is fully conscious.* Place *ammonia* near the nose, determining safe distance by first trying how near it may be held to your own.

Assistant should *hit patient's shoe heels* about twenty (20) times with a stick or something similar and repeat this operation every five minutes until breathing commences.

4. *Give* the patient *fresh air,* but keep him warm. When patient revives *keep him lying down* and *do not raise him.* If doctor has not arrived, give patient one teaspoonful of aromatic spirits of ammonia in a small glass of water if he can swallow.

5. Carry on *resuscitation at closest possible point to the accident. Do not move patient* until he is breathing normally without assistance. If absolutely necessary to move, he should be placed on a hard surface, such as a door or floor of conveyance. *Do not stop or interrupt resuscitation for an instant.*

III—SEND FOR DOCTOR

If alone with victim, *do not neglect immediate and continued resuscitation* in order to call a doctor; start at once, the first few minutes are valuable. If other persons are present, send one of them for a doctor without a moment's delay.

An up-to-date list of doctors, with telephone numbers, is posted close to this chart.

The prone pressure method of artificial respiration described in rules (Section II) is equally applicable to resuscitation from electrical shock as well as all cases of suspended respiration due to drowning, inhalation of gas, smoke or fumes or to other causes.

Do not stop or interrupt resuscitation until patient breathes or rigor mortis (stiffening of the body) sets in.

THIRD RESUSCITATION COMMISSION

(*Under the Auspices of the Committee on Safety Rules and Accident Prevention of the National Electric Light Association*)

PROCEEDINGS AND RESOLUTIONS

Edited by PROFESSORS HOWELL, STEWART and THOMSON

The Commission met in New York at the Rockefeller Institute, Friday, May 17, 1918.

There were present at the meeting: Passed Assistant Surgeon E. F. DuBois, U.S.N.R.F., of the Bureau of Medicine and

Surgery, Navy Department; Dr. D. L. Edsall, Professor of Medicine and Dean, Harvard Medical School; Mr. W. C. L. Eglin, Chairman of Committee on Safety Rules and Accident Prevention of the N.E.L.A.; Dr. Yandell Henderson, Professor of Physiology, Yale University, and Consulting Physiologist of the Bureau of Mines; Dr. Wm. H. Howell, Professor of Physiology and Assistant Director of the School of Hygiene and Public Health, Johns Hopkins University, Member of the National Academy of Sciences; Dr. Reid Hunt, Professor of Pharmacology, Harvard Medical School, Secretary of the Commission; Prof. A. E. Kennelly, Professor of Electrical Engineering at Harvard University and the Massachusetts Institute of Technology; Dr. Charles A. Lauffer, Medical Director of the Westinghouse Electric Company, Pittsburgh, Pa.; Dr. S. J. Meltzer, Rockefeller Institute, Chairman of the Commission, Member of the National Academy of Sciences; Dr. Joseph Schereschewsky, Assistant Surgeon General, U. S. Public Health Service; Dr. G. N. Stewart, Professor of Experimental Medicine, Western Reserve University, Cleveland; Prof. Elihu Thomson, General Electric Company, West Lynn, Mass., Member of the National Academy of Sciences; Lieutenant-Colonel Edward B. Vedder of the Army Medical School; Major Frank G. Young of the Ordnance Division of the War Department.

A telegram was received from Surgeon-General Gorgas that Dr. Charles H. Frazier, Professor of Surgery, University of Pennsylvania, is to represent his office. (In a subsequent communication Major Frazier accepted his appointment.) Conferees: Mr. P. H. Bartlett, Philadelphia Electric Company; Mr. Wills Maclachlan, Electrical Employers Association, Toronto, Canada; Mr. C. B. Scott, Chairman of the Sub-Committee on Accident Prevention, N.E.L.A.; Dr. F. E. Schubmehl, General Electric Company, West Lynn, Mass.

The object of the Commission, the Chairman stated, is to consider efficient methods of artificial respiration in emergency cases, as they are met with in peace as well as in war. For more than a century, England has had several life-saving societies, and many special commissions have been appointed to investigate the methods employed in resuscitation. In this country, about six years ago, a Commission on Resuscitation from Electric Shock was created for the first time, by the initiative of the National Electric Light Association. It is now generally recognized that efficient artificial respiration is, for such conditions, the best and practically the only means available for resuscitation. It requires but little consideration to realize that the need for an efficient means of artificial respiration is very widespread. For instance, in injuries to the head which stop respiration, injuries to the chest (especially double pneumothorax), in laparotomies during which the respiration ceases occasionally, in cases of shock which occur in peace and more so in the present war, in poliomyelitis with stoppage of respiration, in post-diphtheretic paralysis, in poisoning by opiates, by volatile gases (ether, chloroform, etc.), by mine and fuel gases, poisoning by magnesium salts, in electric shock and in drowning. The Committee on Safety Rules and Accident Prevention of the N.E.L.A., of which Mr. Eglin is the chairman, agreed that the Third Resuscitation Commission should consider its problems from a general point of view.

MECHANICAL METHODS.—Dr. Meltzer demonstrated in the laboratory for physiology and pharmacology, the efficiency of the method of pharyngeal insufflation in an etherized dog after complete removal of the anterior wall of the thorax, in which the lungs and heart were exposed to full view. (18 minutes.)

Dr. Rossiter, of the Carnegie Steel Company, demonstrated the latest device of the Pulmotor Company, which is not identical with the original Pulmotor. He showed also the original Pulmotor. He stated that he had resuscitated eight gas cases, in which the respiration had stopped. This was done by the original Pulmotor in which he had more confidence. (30 minutes.)

Dr. James H. Booher, Medical Director of the Life Saving Devices Company, demonstrated the Lungmotor. He showed a number of blood-pressure tracings, taken from animals which had received artificial respiration by means of this apparatus. In reply to a question, Dr. Booher stated that in these experiments the Lungmotor was connected with the animal by means of a tracheal cannula. (In human cases the Lungmotor is applied by means of a face mask.) Dr. Booher left with the Commission histories of a number of cases in which the Lungmotor had been used (30 minutes). (The Commission found no time to examine these written histories, but Dr. Booher mentioned orally especially two cases. One of these cases was subsequently investigated by the Chairman. The life of a poliomyelitis patient with complete paralysis of the respiration was maintained for thirty-six hours by means of the Lungmotor. The reporting physician is of very good standing.)

In introducing Mr. Foregger, the Chairman explained that the physician who was most competent to present the details of the apparatus of the Foregger Company is now in France. Mr. Foregger was allowed fifteen minutes. The apparatus consists in modifications of the insufflation apparatus of Meltzer. Among other changes, the apparatus carried an oxygen generator tank. In reply to a question, Mr. Foregger stated that the oxygen thus generated may last eight or ten minutes.

MANUAL METHODS.—Mr. Eglin read a letter from Mr. M. W. Alexander, of the General Electric Co., stating that he hoped the "Commission would be very definite in recommending the prone-pressure method, as experience has proved its value."

Mr. C. B. Scott stated that the Accident Prevention Committee of the N.E.L.A. had reached the point in its investigation where it felt that the prone-pressure method was best to recommend, bearing in mind that machines are not always available in emergencies. His own company had had nine successful cases of resuscitation by the prone method and three unsuccessful cases in which mechanical means were used.

Dr. Schubmehl stated that the prone-pressure method has been most successfully applied by their two hundred and twenty-five First-Aid Men.

Mr. Maclachlan stated that he had the duty of training possibly three thousand men in the prone method. Their system required the men to practice this method at least once a month. The men are instructed not to desist in less than three and a half hours, and that not till then should they listen to advice from a physician who might tell the operator that the patient was dead.

The Secretary read the following parts of a letter from Professor Shäfer, of Edinburgh, to the Chairman: "The prone method has been adopted *exclusively* for about twelve years by the Royal Life Saving Society, the only important organization in the British Empire whose object is the resuscitation of the apparently drowned. It has also been adopted for several years by the London and other police forces, by the Board of Trade, by the Army and the Navy." "The most important thing is in cases of drowning to have something ready which any man can use; which will effect respiratory exchange—whether exactly as much as normal, matters very little."

Resolutions Adopted by the Commission

In the discussion following the presentation of methods and evidence to the Commission, the following important facts were emphasized:

1. That in most accident cases no resuscitation apparatus is at hand for immediate use.

2. That reliance upon the use of special apparatus diminishes greatly the tendency to train persons in the manual methods and discourages the prompt and persevering use of such methods.

3. That police officers or physicians often interfere with the proper execution of manual methods, in that they direct that the patient be removed in an ambulance to some hospital, thus interrupting the continuance of artificial respiration.

4. That in many hospitals the members of the staff are not all acquainted with the methods of artificial respiration.

5. That in medical schools instruction is not properly provided for students in the manual methods of artificial respiration.

In view of these facts the following resolutions were adopted by the Commission:

1. The prone-pressure, or Schäfer method of resuscitation, is preferable to any of the other manual methods.

2. Medical Schools, Hospitals, Fire and Police Departments, the Army and Navy, First Aid Associations, and industrial establishments in general, should be urged to give instruction in the use of the prone-pressure method of resuscitation.

3. Individuals who, from accident or any other cause, are

in need of artificial respiration, should be given manual treatment by the prone-pressure method immediately on the spot where they are found. It is all important that this aid be rendered at once. The delay incident to removal to a hospital or elsewhere may be fatal, and is justifiable only where there is no one at hand competent to give artificial respiration. If complications exist or arise, which require hospital treatment, artificial respiration should be maintained in transit, and after arrival at the hospital, until spontaneous respirations begin.

4. Persons receiving artificial respiration should, as much as possible, be kept warm and the artificial respiration should be maintained till spontaneous breathing has been permanently restored, or as long as signs of life are present. Even in cases where there is no sign of returning animation, artificial respiration should be kept up for an hour or more.

5. A brief return of spontaneous respiration is not a certain indication for terminating the treatment. Not infrequently the patient after a temporary recovery of respiration stops breathing again. The patient must be watched and if normal breathing stops, the artificial respiration should be resumed at once.

6. Artificial respiration is required only when natural respiration has ceased. In cases of simple unconsciousness from any cause in which natural respiration continues, artificial respiration should not be employed without medical advice.

7. The Commission recommends that in cases of gas asphyxiation, artificial respiration, whether given by a manual method or by special apparatus, should be combined when possible with the inhalation of oxygen from properly constructed apparatus.

8. With regard to the employment of mechanical devices for artificial respiration, the Commission feels that it ought not at present to take a definite stand, either for or against any particular form of apparatus. However, the Commission recommends, that the use and installation of apparatus should be confined, for the present, to properly equipped institutions under medical direction. The Commission recognizes the great need of simple devices capable of performing artificial respiration reli-

ably and efficiently. It therefore recommends a careful study of the problem, directed toward the development of a reliable method appropriate for general adoption.* Such studies can best be carried on in properly equipped hospitals and laboratories which offer opportunities and facilities for critical observation and experimentation.

In view of the importance which the knowledge of proper methods of resuscitation possesses for public health and safety, and considering the fact that many practitioners, members of hospital staffs and graduates of medicine are not thoroughly familiar with the methods of resuscitation, especially that of the prone-pressure method, the Commission recommends:

(*a*) *That medical journals* (and other scientific and practical journals which are interested in the problem of resuscitation) *be asked to publish the resolutions adopted by the commission.*

(*b*) *That a copy of these resolutions be sent to the medical colleges with a request that proper instruction in this subject* shall be arranged for in the *College Schedules.*

(*c*) That these resolutions be sent to as many hospitals as possible, with the recommendations that members of the house staff shall familiarize themselves with the methods of resuscitation.

(*d*) In order that the resolutions of the Commission may be brought to the attention of interested circles (fire and police departments, industrial plants, etc.), it was agreed that they be communicated to the Associated Press (by the National Electric Light Association).

It was voted that the Third Resuscitation Commission should be properly organized and continue its existence, ready to respond when requirements arise. The following officers were elected:

President—Dr. S. J. Meltzer.
Vice-president—Dr. Yandell Henderson.
Secretary—Dr. Reid Hunt.
Treasurer—Mr. W. C. L. Eglin.

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* See Appendix.

It was voted to appoint a committee for the collection of verifiable data relating to resuscitation. The President appointed to the committee:

Dr. D. Edsall—Chairman.
Dr. Reid Hunt—Secretary.
Prof. Elihu Thomson and the President ex-officio.

APPENDIX

The Commission consists of fifteen members. Fourteen approved the foregoing report without qualifications. The fifteenth member wishes to qualify his vote by the following:

STATEMENT

Dr. Yandell Henderson qualifies his support of the resolutions as follows:

"While I concur in a considerable part of the report of the Resuscitation Commission, I dissent from the statement in Resolution 8, recognizing 'the great need of simple devices capable of performing artificial respiration reliably and efficiently.'

"Devices which are excellent from the mechanical standpoint are now available and widely sold; but the evidence regarding them indicates clearly, I believe, that even if these devices were on the spot where several gassings or electrocutions occurred and if all the victims were treated with them, except one who was given manual (prone pressure) treatment, this one would have much the best chance of recovery. In actual practice the apparatus is seldom right on the spot adjusted and ready. Critical time is lost, and thus in the above suppositious cases, as they actually occur, the only victim with any considerable chance of resuscitation (aside from those who recover spontaneously and are credited to the apparatus) is the one treated manually.

"Even more important is the fact, demonstrated now by universal experience, that when apparatus is known to be obtainable, it is sent for and the manual method neglected. Thus, today the apparatus in public use is on the whole contributing very materially to decrease the saving of life."

TABULATED ANALYSIS OF ACCIDENT REPORTS

Previous reports have emphasized the importance of analyses of industrial accidents as a means of determining at what points activities should be centered to obtain the best results. The value of these analyses and their benefit to member companies and to the Sub-Committee have been pointed out and explained. It is felt, however, by the Sub-Committee that these benefits are not as yet fully appreciated by the majority of member companies and that their lack of cooperation in sending in copies of accident reports is largely accounted for by this fact.

The following analyses contain 10,435 reported accidents, including those which appeared in previous reports of the Sub-Committee, and cover a period of six years. It is hoped that during the coming year a much larger number of companies will assist the Sub-Committee by reporting their accidents regularly and thus add to the increasing value of these analyses. These reports should be sent to Mr. W. C. Anderson, Statistical Secretary, National Electric Light Association, 29 West 39th Street, New York City.

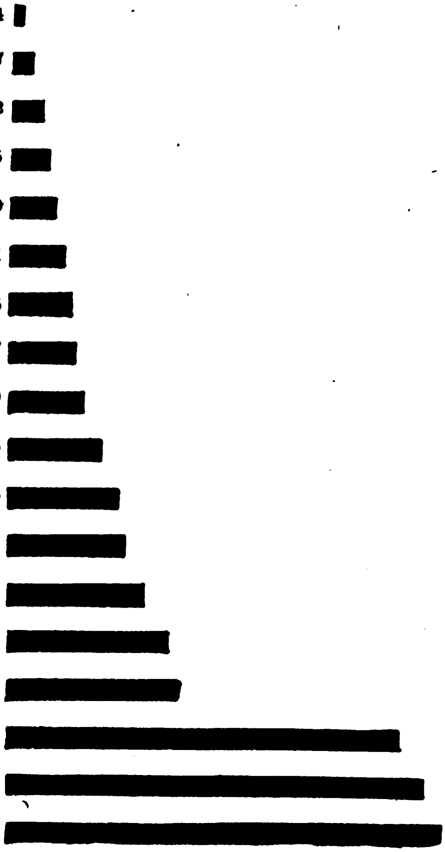
TABULATED ANALYSES OF ACCIDENT REPORTS

Prepared by the Sub-Committee on Accident Prevention of the National Electric Light Association.

CHART No. 1

10,435 Reported Accidents, Analyzed as to Cause

	No. of Accidents	Per Cent
Altercation	44	.4
Overcome by Gas or Heat	74	.7
Explosion Gas, Gasoline, Steam	120	1.2
Lamp Breaking	153	1.5
Injured by Doors and Windows	194	1.9
Injured by Animal	223	2.1
Miscellaneous	264	2.5
Machinery in Motion	278	2.7
Acid, Solder, Compounds (Burns from)	314	3.0
Colliding with Obstruction	403	3.8
Wagon, Auto, Motorcycle or other Vehicle	469	4.5
Injured by Nail or other Sharp Object	496	4.8
Foreign Body in Eye	589	5.6
Struck by Falling Body	704	6.7
Electric Current (Shock, Burns, Eye-Flash)	741	7.1
Slipping, Tripping, Falling	1,699	16.3
Handling Tools	1,792	17.2
Handling Material	1,878	18.0
	10,435	100.0



Gen.

CHART No. 2

Accidents Occurring in or About Companies' Premises, Constituting 52.4% of 10,435 Reported Accidents, Analyzed as to Cause

	No. of Accidents	Per Cent
Altercation	22	.4
Overcome by Gas or Heat	28	.5
Explosion Gas, Gasoline, Steam	57	1.0
Wagon, Auto, Motorcycle or other Vehicle	85	1.5
Lamp Breaking	110	2.2
Acid, Solder, Compounds (Burns from)	136	2.5
Injured by Doors and Windows	144	2.6
Miscellaneous	208	3.8
Colliding with Obstruction	261	4.8
Machinery in Motion	266	4.9
Injured by Nail or other Sharp Object	293	5.3
Struck by Falling Body	359	6.5
Electric Current (Shock, Burns, Eye-Flash)	363	6.6
Foreign Body in Eye	394	7.2
Slipping, Tripping, Falling	758	13.9
Handling Tools	967	17.7
Handling Material	1,017	18.6
	5,468	100.0

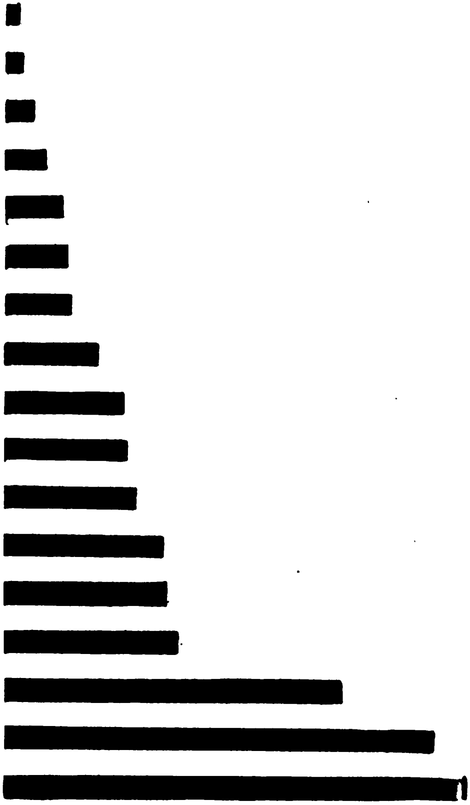


CHART No. 3

Accidents Occurring Outside of Companies' Premises, Constituting 47.6% of 10,435 Reported Accidents, Analyzed as to Cause

	No. of Accidents	Per Cent
Altercation	22	.4
Lamp Breaking	43	.9
Explosion, Gas, Gasoline, Steam	63	1.5
Colliding with Obstruction	142	2.8
Miscellaneous	170	3.4
Acid, Solder, Compounds (Burns from)	178	3.6
Foreign Body in Eye	195	3.9
Injured by Nail or other Sharp Object	203	4.1
Injured by Animal	217	4.4
Struck by Falling Body	345	6.9
Electric Current (Shocks, Burns, Eye-Flash)	378	7.6
Wagon, Auto, Motorcycle or other Vehicle	384	7.7
Handling Tools	825	16.6
Handling Material	861	17.3
Slipping, Tripping, Falling	941	18.9
	4,967	100.0

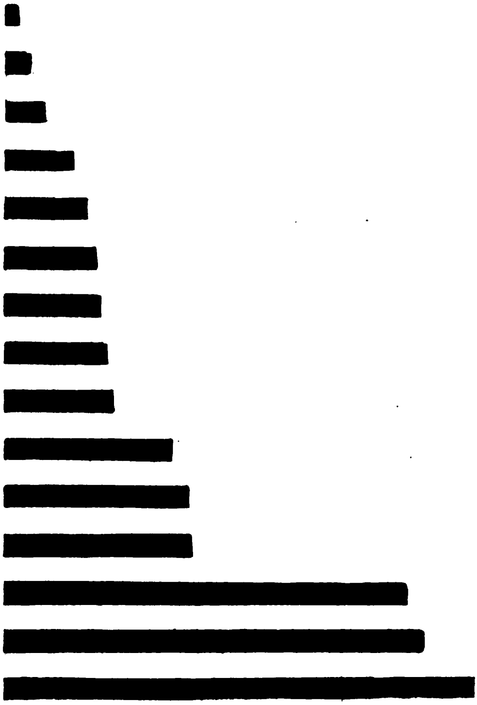


CHART No. 4

FALLS

Constituting 16.3% of 10,435 Reported Accidents, Analyzed as to Cause

	No. of Accidents	Per Cent
From Scaffold	16	1.0
From Temporary Support	116	6.8
Into Excavation	116	6.8
From Pole	146	8.6
On Stairs	199	11.7
Over Obstruction	231	13.6
From Ladder	231	13.6
From Other Elevation	246	14.5
On Level	398	23.4

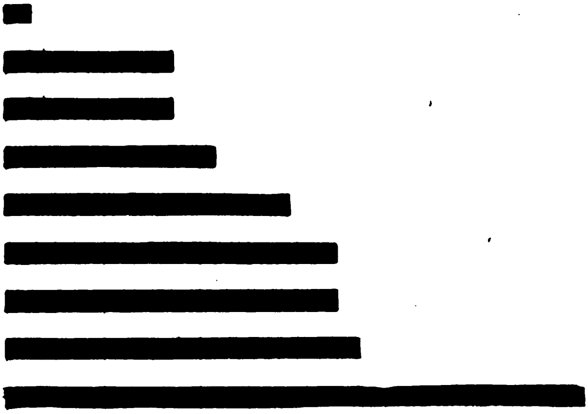


CHART No. 5

HANDLING TOOLS

Constituting 17.2% of 10,435 Reported Accidents, Analyzed as to Kind of Tool

	No. of Accidents	Per Cent
Torch	2	.1
Jack	25	1.4
Pick	29	1.6
Pike Pole	35	2.0
Spurs	38	2.1
Stock and Die	39	2.2
Shovel	40	2.2
Grinding Tools	50	2.8
Chisel	54	3.0
Pliers	71	4.0
Pinch and Crowbar	76	4.2
Saw	78	4.4
Screw Driver	88	4.9
Drill	115	6.4
Poker and Clinker Bar	127	7.1
Miscellaneous	164	9.2
Wrench	205	11.4
Hammer, Sledge	267	14.9
Knife	289	16.1

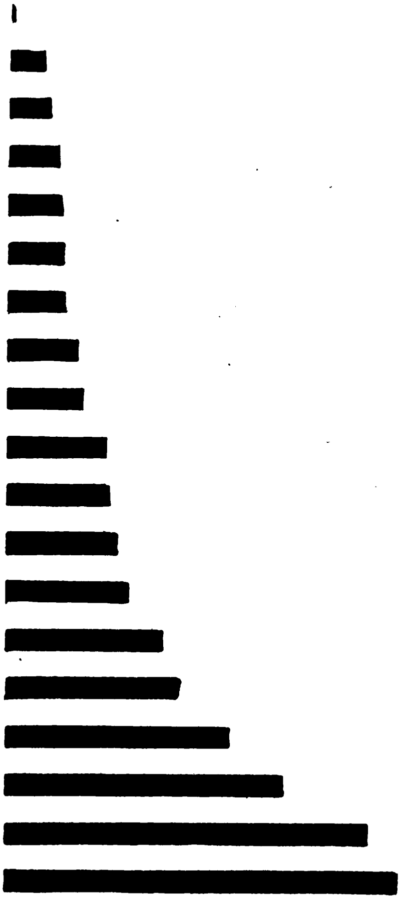
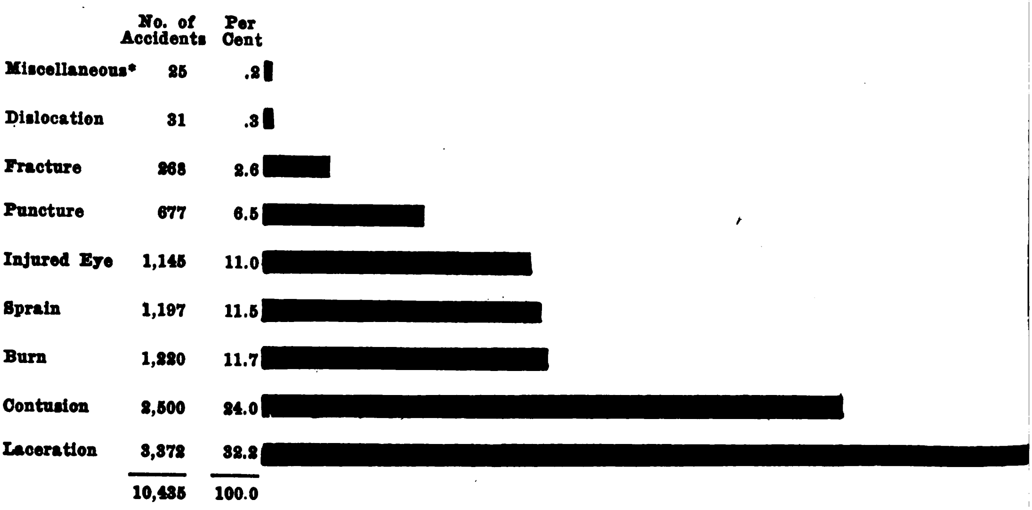


CHART No. 6

10,435 Reported Accidents

Analyzed as to Nature of Injury



*Miscellaneous item includes accidents which are not covered by the other headings, such as frozen parts, exhaustion, overcome by gas, etc.

CHART No. 7

7133 Reported Accidents

Analyzed as to Length of Service of Injured

	No. of Accidents	Per Cent
Over 20 years	77	1.1
15-20 years	114	1.6
10-15 years	317	4.5
9-10 years	97	1.3
8-9 years	86	1.2
7-8 years	158	2.2
6-7 years	152	2.1
5-6 years	300	4.2
4-5 years	371	5.2
3-4 years	459	6.5
2-3 years	741	10.4
1-2 years	1,258	17.6
6 months to 1 year	1,154	16.2
Less than 6 months	1,849	25.9
	7,133	100.0

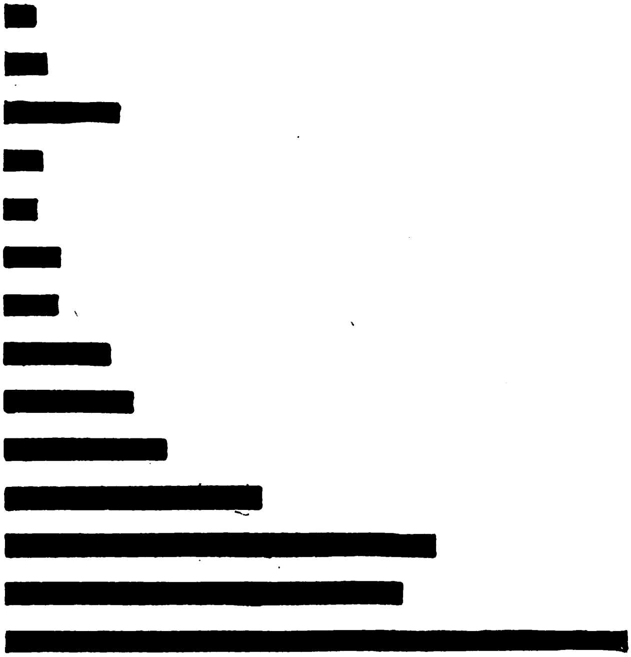


CHART No. 8

10,345 Reported Accidents

Analyzed as to Occupation of Injured

	No. of Accidents	Per Cent
Carpenter	47	.4
Errand Boy	55	.5
Conveyor Attendant	58	.6
Transformer Winder	62	.6
Water Tender	68	.7
Battery Man	84	.8
Janitor	136	1.3
Arc Trimmer	143	1.4
Boiler Cleaner	144	1.4
Teamster	156	1.5
Engineer	157	1.5
Troubleman	168	1.6
Oiler	194	1.9
Lamp Etcher—Tester	209	2.0
Office Help	218	2.1
Stock Clerk	246	2.4
Chauffeur	297	2.8
Cable Splicer	380	3.6
Groundman	476	4.6
Repairman	523	5.0
Machinist	529	5.1
Station Construction Man	527	5.1
Fireman	532	5.1
Miscellaneous	600	5.7
Operator	632	6.0
Interior Wireman	687	6.6
Meterman	708	6.8
Laborer	1,163	11.1
Lineman	1,236	11.8
	10,435	100.0

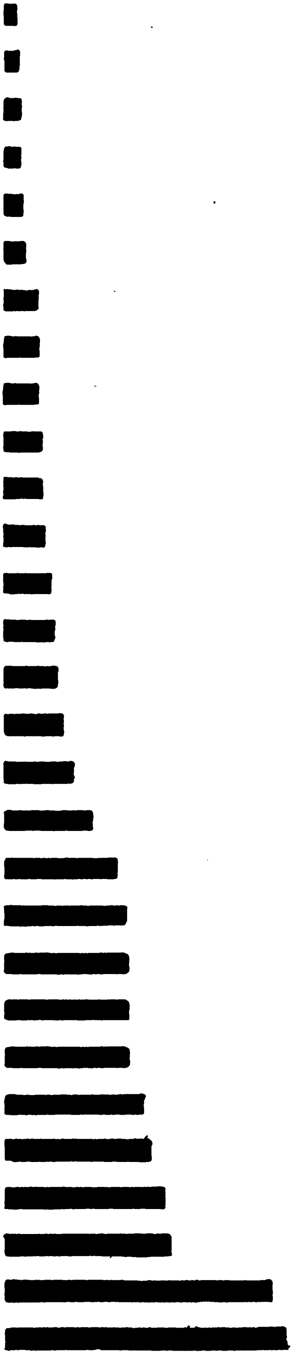


CHART No. 9

Anatomical Distribution of 10,435 Reported Accidents

	No. of Accidents	Per Cent
Ear	21	.2
Teeth	24	.2
Chin	30	.3
Heel	44	.4
Chest	45	.4
Lips	54	.5
Thigh	56	.5
Neck	58	.6
Ribs	65	.6
Instep	69	.6
Nose	73	.7
Hips	78	.7
Cheek	90	.9
Shin	95	.9
Elbow	105	1.0
Side	151	1.5
Miscellaneous	154	1.5
Shoulder	179	1.7
Forehead	180	1.7
Scalp	194	1.9
Forearm	197	1.9
Face	212	2.0
Head	233	2.2
Toes	246	2.4
Knee	298	2.9
Ankle	319	3.1
Arm	326	3.1
Leg	396	3.8
Wrist	399	3.8
Back	405	3.9
Feet	530	5.1
Thumb	715	6.9
Hands	1,139	10.9
Fingers	2,021	19.4
Eyes	1,234	11.8

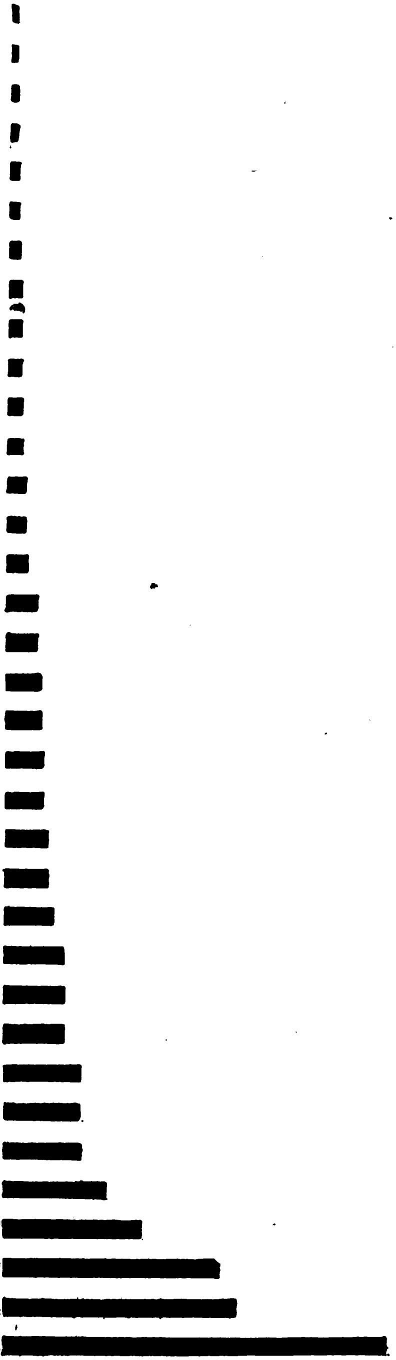
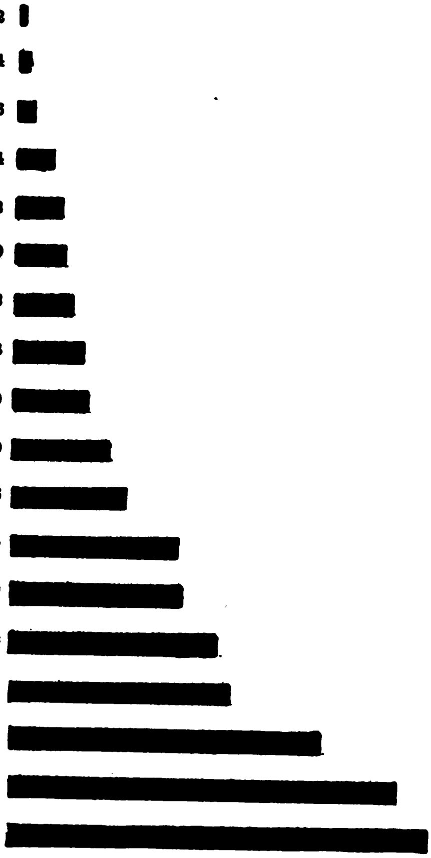


CHART No. 10

Accidents Resulting in No Loss of Time or a Loss of Less Than One Day Constituting 67.3% of 4496 Reported Accidents, Analyzed as to Cause

	No. of Accidents	Per Cent
Altercation	7	.2
Explosion Gas, Gasoline, Steam	11	.4
Overcome by Gas or Heat	17	.6
Lamp Breaking	41	1.4
Injured by Animal	53	1.8
Injured by Doors and Windows	58	1.9
Acid, Solder, Compounds (Burns from)	70	2.3
Wagon, Auto, Motorcycle or other Vehicle	84	2.8
Machinery in Motion	92	3.0
Miscellaneous	117	3.9
Electric Current (Shock, Burns, Eye-Flash)	139	4.6
Struck by Falling Body	206	6.8
Colliding with Obstruction	208	6.9
Foreign Body in Eye	254	8.4
Injured by Nail or other Sharp Object	272	9.0
Slipping, Tripping, Falling	388	12.8
Handling Material	485	16.0
Handling Tools	521	17.2

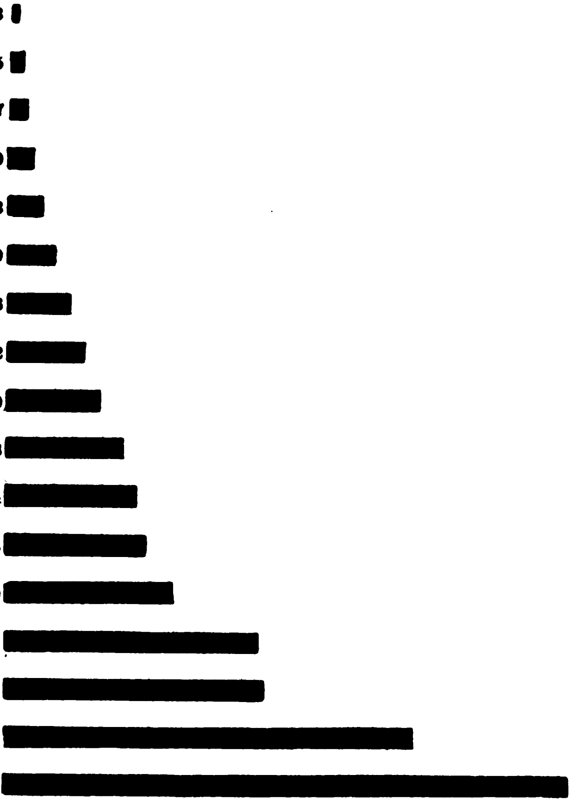


NOTE.—Of the above 3,023 Reported Accidents, 1,926, or 63.7% occurred in or about companies' premises. 1,097, or 36.3%, occurred outside of companies' premises.

CHART No. 11

Accidents Resulting in Loss of Time of More Than One Day, But Not Fatal, Constituting 32.3% of 4496 Reported Accidents, Analyzed as to Cause

	No. of Accidents	Per Cent
Altercation	5	.3
Injured by Animal	8	.5
Overcome by Gas or Heat	10	.7
Injured by Doors and Windows	15	1.0
Explosion Gas, Gasoline, Steam	19	1.3
Acid, Solder, Compounds (Burns from)	27	1.9
Machinery in Motion	38	2.6
Colliding with Obstruction	47	3.2
Foreign Body in Eye	56	3.9
Injured by Nail or other Sharp Object	70	4.8
Wagon, Auto, Motorcycle or other Vehicle	78	5.4
Miscellaneous	84	5.8
Electric Current (Shocks, Burns, Eye-Flash)	100	6.9
Struck by Falling Body	153	10.5
Handling Tools	155	10.7
Handling Material	247	17.0
Slipping, Tripping, Falling	347	23.5



NOTE.—Of the above 1,453 Reported Accidents, 801, or 55.2%, occurred in or about companies' premises. 652, or 44.8%, occurred outside of companies' premises.

CHART No. 12

Accidents Resulting Fatally Constituting 0.4% of 4496 Reported Accidents, Analyzed as to Cause

	No. of Accidents	Per Cent
Overcome by Gas or Heat	1	5.3
Explosion Gas, Gasoline, Steam	1	5.3
Machinery in Motion	1	5.3
Wagon, Auto, Motorcycle or other Vehicle	1	5.3
Electric Current	15	78.8
	19	100.0

NOTE.—Of the above 19 Reported Accidents, 10, or 52.6%, occurred in or about companies' premises. 9, or 47.4%, occurred outside of companies' premises.

CONCLUSION

It is recommended by your Sub-Committee that the following be included in the program of our successors:

1. Consideration of recommendations to the electrical industry of first aid equipment and first aid practices.
2. Consideration of the use of disconnecting switches in relation to the prevention of accidents.
3. Completion of the tentative recommended specifications for rubber gloves and linemen's belts.
4. Study of the proper instructions for use of protecting devices or barriers around electrical apparatus by employees, particularly covering such accidents as have been caused by their removal.
5. Renewed efforts to secure accident reports from a larger number of member companies, for use in preparing the tabulated analyses.

Respectfully submitted,

COMMITTEE:
CHARLES B SCOTT, *Chairman*
M W ALEXANDER
R L BAKER
P H BARTLETT
H J BURTON
H B HARMER
P JUNKERSFELD
WILLS MACLACHLAN
W T MORRISON
W C ANDERSON, *Conferee*

I move you, Mr. Chairman, the adoption of this report. (Applause.)

THE PRESIDENT: Owing to the lack of time, this report will be open for discussion at a meeting to be held at 2:30 o'clock this afternoon on the 11th floor of the Hotel Traymore, in the Belvidere Room.

We will now proceed to the report of the Lamp Committee, which will be presented by Mr. Frank W. Smith, New York City, the Chairman of the Committee.

REPORT OF THE LAMP COMMITTEE

INTRODUCTION

The report of the Lamp Committee for the current year will confine itself largely to presenting statistical data with respect to the output of incandescent lamps and to other details, in the same general form as reports submitted for previous years.

During the greater part of the year the Committee has been inactive, and, except for the preparation and completion of arrangements for the lighting exhibit, has hardly more than reorganized for active work. Also the several sub-committees, which have previously been following certain details of the lamp business, can at this time only report progress.

It is felt that the incoming Lamp Committee will find a fertile field to "carry on," taking up some of the subjects which have been under investigation.

Lighting Exhibit

It will be remembered that plans had been completed in 1917 for a special lighting exhibit under the auspices of the Committee. These plans, which were interrupted in connection with all other activities of the Association because of the war, were this year revived, and the Committee presents for the attention of the delegates a general exhibit which, it is hoped, will meet with your approval and be found interesting, constructive and altogether helpful. This production which may be considered the main portion of your Committee's report, has been possible only by reason of the generosity of the lamp manufacturers and the cooperation of the Lighting Sales Bureau of the Commercial Section.*

Lamp Sales

The total sales of incandescent lamps for domestic use, excluding miniature, for the year 1918 amounted to 186,000,000 lamps, an increase of 9.4 per cent over the previous year, as compared with a gain of 17 per cent for 1917 over 1916. Of

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Manuscript of this report was received April eighteenth.

*An article describing the Exhibit, together with several illustrations, was printed in the July, 1919, Bulletin, beginning on page 359.

this total, 166,000,000 lamps were of the tungsten filament type, an increase of 12 per cent. There were 20,000,000 carbon filament lamps produced, including carbon and gem, a decrease of 9.5 per cent over the preceding year.

It will be seen that the tungsten lamp production represented 89 per cent of the total number of lamps sold in 1918, compared with 87 per cent for the preceding year.

Table 1 shows the distribution of lamp sales which is also indicated graphically in Fig. 1, covering the past twelve year period (1907-1918 inclusive).

Table 1

DOMESTIC INCANDESCENT LAMP SALES 1907-1918 INCLUSIVE

Year	Per Cent Carbon and Gem	Per Cent Tantalum	Per Cent Tungsten
1907	99.2	0.7	0.1
1908	92.7	1.8	5.5
1909	84.1	2.1	13.8
1910	78.0	3.5	18.5
1911	71.9	2.7	25.4
1912	59.0	1.0	40.0
1913	43.3	0.1	56.6
1914	29.5	...	70.5
1915	21.1	...	78.9
1916	16.3	...	83.7
1917	13.0	...	87.0
1918	11.0	...	89.0

Of the total tungsten lamps sold (166,000,000), there were 142,000,000 of the vacuum type, which was an increase over 1917 of 8.5 per cent, and 24,000,000 of the gas filled type, an increase over the previous year's production of 37 per cent.

METALLIZED FILAMENT LAMPS

Gem Lamp

In the report of your Committee of last year, it was stated that the demand for gem lamps was rapidly becoming less and less, and that this decrease was making it increasingly difficult to supply the lamps to fit the voltages demanded, and that the use of this type of lamp was rapidly being discontinued by central station companies.

Since that time demand for gem lamps has ceased, and about the first of this year the manufacturers discontinued entirely their production so that no gem lamps are now available.

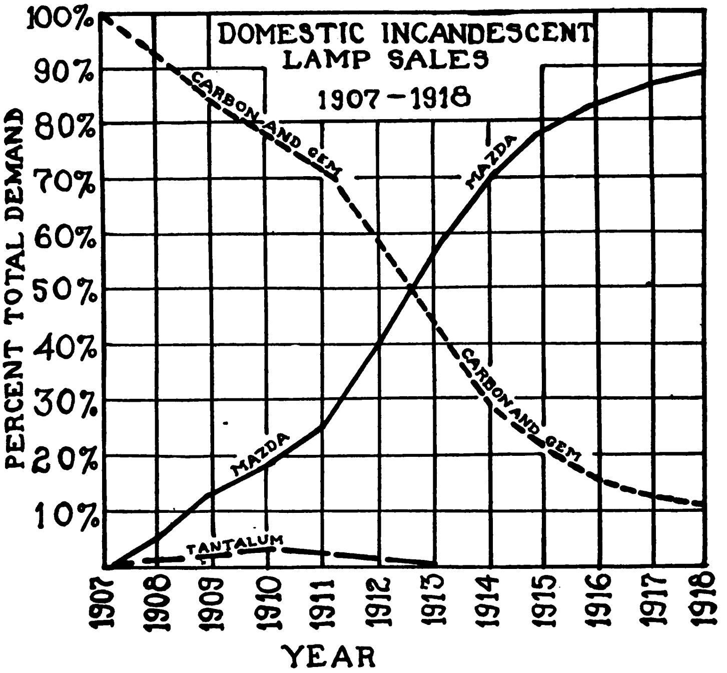


Fig. 1

Thus disappears from the field this metallized filament or gem type of lamp, which first came into use in 1905 and which constituted a useful transition from the sturdy, reliable, though now considered inefficient, carbon lamp, to the modern tungsten lamp of high efficiency and great intrinsic brilliancy.

Carbon Lamp

The demand for carbon lamps (excluding gem) continues about the same as for the past two or three years. Their use still appears, generally speaking, to be confined to such places where the service is so severe, due to breakage and rough handling, that the robust quality of the carbon lamp is considered of more value than the higher efficiency of the tungsten lamp. There are, however, a few companies continuing to furnish the carbon lamp to their customers. Reference is made to this subject further on. The production of the carbon lamp has, no doubt, maintained its record for the past year, because of the great amount of temporary lighting and of industrial construction carried on during the war period.

It is felt by your Committee that the decline of the production and use of the carbon lamp will be more rapid from now on, particularly with the possibility of the development for special uses of a more sturdy tungsten lamp, to which reference is made further on in this report.

Miniature Lamps

There has been a considerable growth in the use of tungsten miniature lamps, owing to the increased use of automobiles and flashlights, for which service these lamps are used exclusively. The number of carbon miniature lamps now used is negligible. On central station circuits, tungsten miniature lamps for candelabra and Christmas tree lighting are being used in increasing numbers.

Distribution by Types and Sizes

The detail as to the percentages of total lamps sold in each of the various voltage groups is indicated in Table 2. More than 82 per cent of all lamps, (tungsten, carbon and gem) sold in 1918 were of the 110-125 volt group; 7.6 per cent were of the 220-250 volt group. Table 3 gives the wattage distribution for the past three years, of multiple tungsten Type B and C lamps.

Considering only tungsten lamps in the 110-125 volt group, the distribution by sizes of lamps compared with the preceding year and the percentages of increase or decrease in sales are given in Table 4. It will be seen that the 40 watt lamp is still the most popular size, more than one-quarter of the entire demand for tungsten lamps in this voltage group (110-125) being supplied in this size. The 25-watt lamp is a close second, with the 60-watt following next in order.

It will be seen that the 50 watt lamp of the vacuum class, first put on the market less than four years ago, made by far the greatest gain (30 per cent) during the year, and now occupies fourth place of the total sales of this voltage group.

The output of sign lamps shows a falling off of 33 per cent for the year, largely due, no doubt, to the curtailment in sign and other outside lighting brought about by Governmental restrictions placed upon this character of service during the war.

The 100 watt vacuum lamp is shown to have decreased considerably in sales, this lamp being displaced by the 75-150 watt gas filled lamps. The average increase in the 110-125 volt vacuum tungsten lamp sales was 7 per cent, while the sales of the gas filled lamps in this voltage group increased nearly 50 per cent.

Of the gas filled lamps, the 100 watt is still the most popular size, with the 75 watt following closely. While lamps of this type of the voltage group given show but 13.4 per cent in numbers of lamps, the wattage output is 36 per cent, that is, over one-third of the wattage of the 110-125 volt lamps sold during the year were of the gas filled type.

Table 2

1918 Distribution by Voltages of Total Lamps Sold

Voltage Group	Per Cent of Total Sales
110-125 volts	82.1%
220-250 volts	7.6%
Street Series (4.0, 5.5, 6.6 and 7.5 amperes)	1.3%
Street Railway (5 in series on 525-650 volts)	3.8%
30 and 60 volts (Train and Farm Lighting)	4.0%
Miscellaneous	1.2%
Total	100.0%

Table 3

Detail Distribution of Multiple Tungsten Lamp Sales

	Per Cent of Group Sales			Per Cent of Total Tungsten Sales		
Lamp	1916	1917	1918	1916	1917	1918
	Multiple Mazda B Lamps					
Signs	8.8	7.6	5.9	7.8	6.4	4.9
15 watts	6.1	5.0	6.7	5.3	4.2	5.5
20 "	2.0	1.2	....	1.7	1.0	....
25 "	25.7	27.1	27.1	22.4	23.0	22.4
40 "	29.0	29.5	29.4	25.2	25.0	24.3
50 "	6.0	8.5	10.2	5.2	7.0	8.4
60 "	17.9	17.3	16.2	15.6	14.8	13.3
100 "	3.8	3.2	2.4	3.3	2.7	2.0
Misc.	0.7	0.6	2.1	0.6	0.5	1.7
Total Multiple "B"	100.0	100.0	100.0	87.1	84.6	82.5
	Multiple Mazda C Lamps					
75 watt	25.0	31.0	32.1	1.9	3.1	4.1
100 "	46.0	39.0	36.9	3.5	3.9	4.7
150 "	....	2.1	3.6	....	0.2	0.4
200 "	14.5	15.3	15.6	1.1	1.5	1.9
300 "	5.5	4.2	4.0	0.4	0.4	0.5
400-500 Watt	4.0	4.2	4.1	0.3	0.4	0.5
750-1000 "	2.5	2.1	1.3	0.2	0.2	0.3
Misc.	2.5	2.1	2.4	0.2	0.2	0.3
Total Multiple "C"	100.0	100.0	100.0	7.6	9.9	12.7

Table 4

Distribution of Tungsten Lamps of the 110-125 Volt Group

Size of Lamp	Per Cent of Group Sales 1917	Per Cent of Group Sales 1918	Per Cent Increase or Decrease in Actual Sales (1918 over 1917)
	VACUUM CLASS		
Sign	4.5%	2.7%	Decrease 33%
10-watt S-17 bulb	2.7%	2.4%	No change
15 watt	6.9%	5.8%	Decrease 7%
25 watt	24.3%	23.5%	Increase 7%
40 watt	25.0%	25.5%	Increase 13%
50 watt	7.5%	8.8%	Increase 30%
60 watt	15.1%	14.0%	Increase 3%
100 watt	3.0%	2.1%	Decrease 21%
Miscellaneous	0.9%	1.8%	....
Total Vacuum Class	89.9%	86.6%	Increase 7%
	GAS-FILLED CLASS		
75 watt	3.2%	4.4%	Increase 49%
100 watt	4.0%	4.9%	Increase 36%
150 watt	0.3%	0.5%	Increase 109%
200 watt	1.4%	2.1%	Increase 57%
300 watt	0.4%	0.5%	Increase 41%
400-1000 watt	0.6%	0.7%	Increase 37%
Miscellaneous	0.2%	0.3%	....
Total Gas-Filled Class	10.1%	13.4%	Increase 47%
Grand Total	100.0%	100.0%	Increase 11%

AVERAGE CANDLEPOWER, WATTS AND EFFICIENCY

The average candlepower of lamps sold (all types) during the year was 51.5 c. p., an increase of 6 per cent over 1917. The average wattage was 52.7, an increase of 4 per cent. The average lumens per watt of the lamps sold was 10.30, over three times that of 1907, the year when the tungsten lamps were first introduced. These data for each year since 1907 are given in Table 5, and also indicated graphically in Fig. 2.

Table 5

Average Candlepower, Watts and Efficiency

Year	Average Candlepower	Average Watts	Average Lumens per Watt
	All Lamps		
1907	18.0	53.0	3.33
1908	19.0	53.0	3.52
1909	21.0	52.0	3.96
1910	23.0	51.0	4.42
1911	25.0	51.0	4.80
1912	26.0	49.0	5.20
1913	29.4	47.0	6.13
1914	38.2	48.0	7.80
1915	42.2	47.4	8.74
1916	45.8	48.6	9.60
1917	48.7	50.7	9.86
1918	51.5	52.7	10.30

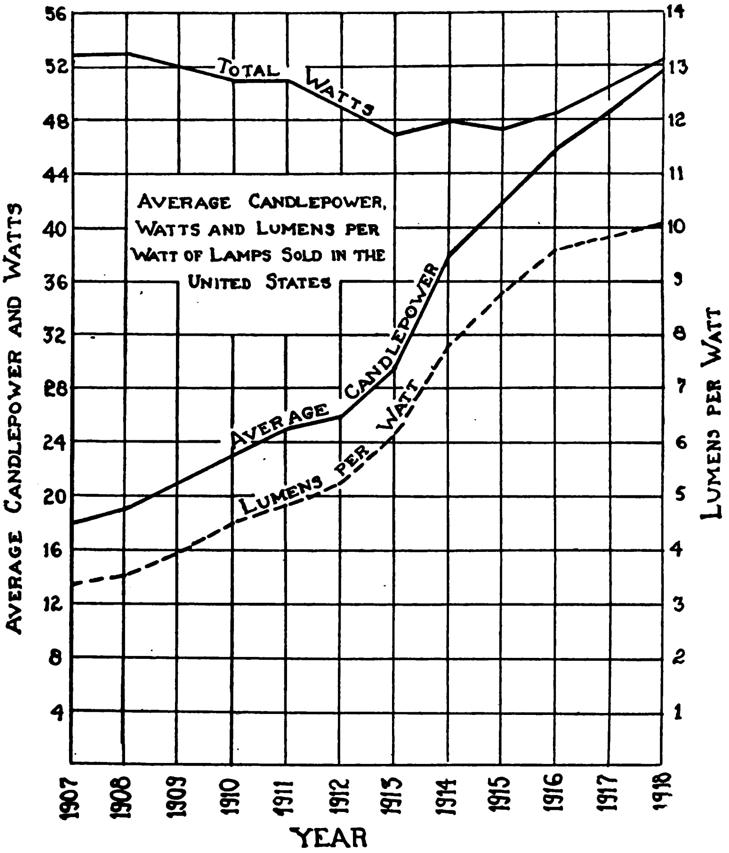


FIG. 2

Street Series Lamps

During the year the average candlepower of street series mazda lamps was 157, a decrease of nearly 2 per cent over 1917, due to the lesser number of 400 and 600 c.p. lamps used. Excluding the 250 and higher candlepower lamps, which are largely used in place of carbon arc lamps, the average candlepower in 1918 was 74, an increase of nearly 3 per cent. The average candlepower of street series mazda lamps since 1907 is graphically shown in Fig. 3.

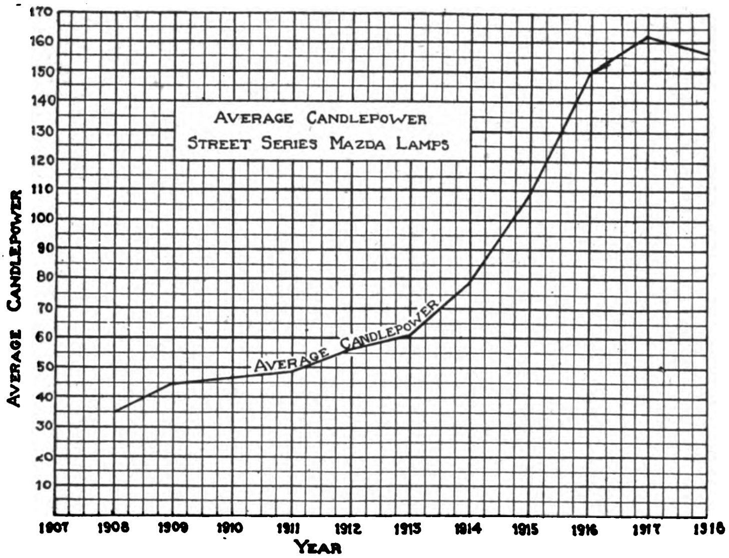


Fig. 3

The sales of lamps for series street lighting circuits during the year, compared with 1917, in candlepower sizes and ampere ratings are given in Table 6. Comparison of these data with the report of last year shows the following:

By candlepower, a slight decrease in the use of lamps of under 60 c.p., of 80 c.p., of 400 c.p., and of 600 c.p. A considerable increase in the use of the 100 c.p. size, and a slight increase in the use of the 60 c.p. and 250 c.p. sizes. By ampere rating, the use of circuits other than 4.0, 5.5, 6.6, 7.5 amperes is negligible. As shown in last year's report, the 6.6 ampere circuit continues to be the most popular, over half of all street series lamps sold being of this ampere rating. The 15 and 20 ampere lamps used on compensators are generally on the 6.6 ampere circuits, which would tend to increase the number of lamps actually used on this ampere circuit.

Table 6

STREET SERIES LAMPS

By Candlepower Sizes

Candlepower	Per Cent Total 1917	Per Cent Total 1918
Under 60	14.5	13.3
60	22.6	22.7
80	11.0	10.8
100	25.5	29.3
250	11.0	11.7
400	8.2	6.2
600	6.3	5.1
1000	0.9	0.9
Total	100.0	100.0

By Ampere Ratings

Amperes	Per Cent Total 1917	Per Cent Total 1918
4	11.3	11.8
5.5	9.6	10.9
6.6	53.3	53.2
7.5	16.7	15.5
15 and 20	9.1	8.6
Total	100.0	100.0

Voltage Standardization

The Sub-Committee on Voltage Standardization has done no active work during the war period, but very considerable progress has been made throughout the industry in the matter of standardizing voltages of incandescent lamps, and it is likely that the incoming committee can take under consideration some constructive work along this line.

As previously stated, more than 82 per cent of all lamps sold were of the 110-125 volt group and nearly 75 per cent of these lamps were of the three standard voltages which your Committee has heretofore recommended should be used, namely, 110, 115, and 120. That much has been accomplished along standardization is apparent from the fact that in 1917, 65 per cent of all lamps in the range from 100 to 130 volts were of these three voltages, and in 1913, 45 per cent were thus represented.

Table 7 gives the percentage of each voltage lamp sold during the year, compared with 1917, and Fig. 4 indicates graphically the changes between the years 1913 and 1918.

Colored Lamp Bulbs

As reported in 1917, the great increase in efficiency of light generation has widened the economic possibilities of the application of colored light and, as then reported by the Committee, certain investigations were under way. Some progress has since been made, although no extended activity has been carried on during the past year.

The Sub-Committee having this subject under investigation, has directed its efforts to securing a reasonable agreement be-

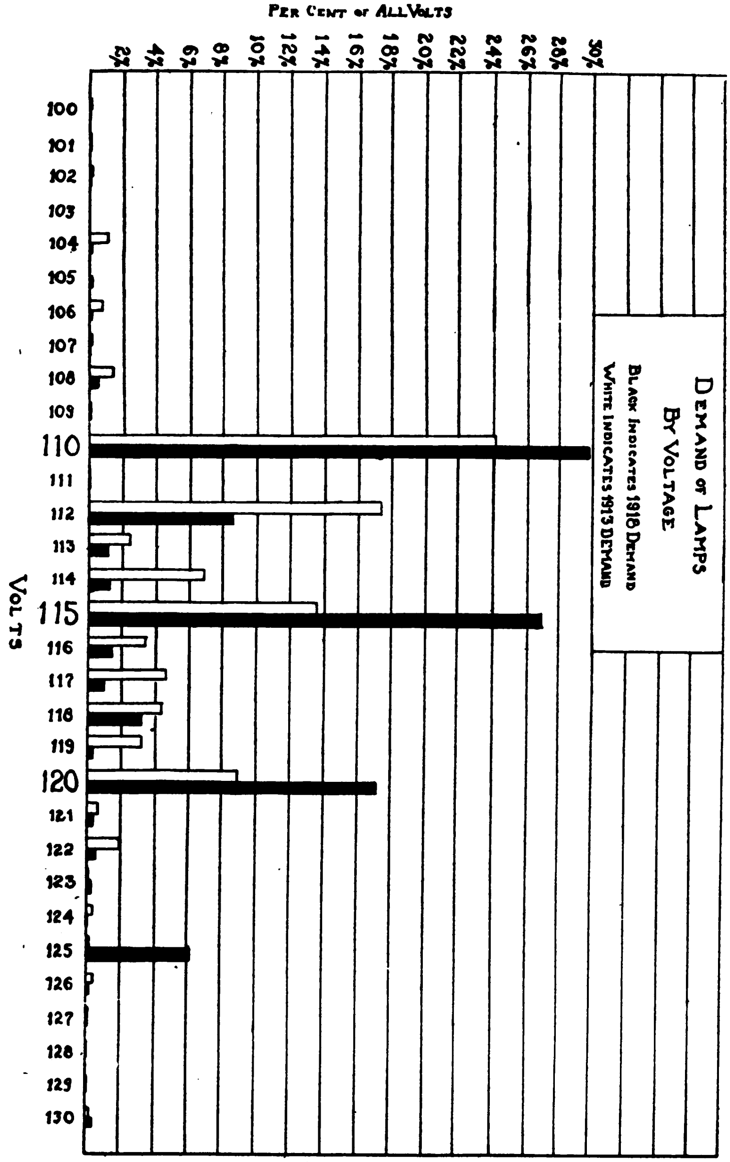

Demand of Lamps
By Voltage
Black Indicates 1916 Demand
White Indicates 1913 Demand
Per Cent of All Volts
2%
4%
6%
8%
10%
12%
14%
16%
18%
20%
22%
24%
26%
28%
30%
Volts
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130

FIG. 4

Table 7

Demand of Lamps by Voltages

Voltage	1917 —Per Cent	1918 Total—
100-109	1.2%	0.3%
110 (Standard)	25.0%	29.9%
111	......	......
112	10.0%	8.7%
113	3.0%	1.2%
114	2.5%	1.4%
115 (Standard)	24.7%	27.0%
116	2.0%	1.5%
117	2.0%	1.0%
118	4.0%	3.3%
119	2.0%	0.2%
120 (Standard)	15.5%	17.7%
121-124	2.3%	1.3%
125	4.5%	6.1%
126-130	1.3%	0.4%
Total 100-130 Volts	100.0%	100.0%

tween central station members on the tone of yellow or amber bulbs to be standardized for early development; although a considerable range of opinion still exists, the weighted average of some eighty observers indicates that a tone approximating that of the kerosene flame is most generally acceptable.

Lamps which have given this tone by superficial coloring have been submitted to the committee. The color obtained in this way is said to be permanent, and the general effect of the lamp is quite pleasing. The question of putting a lamp of this character in production would, no doubt, be considered by the manufacturers if there seemed to be a demand for such a lamp.

COUNTRY HOME LIGHTING OUTFITS

In the 1917 report the Committee pointed out the types of lamps being produced for gasoline electric generator storage battery sets.

It is reported that during the past two years there has been a very considerable development in the introduction of these units. It is felt that there is no conflict of interest between the manufacturer of these home lighting outfits and the central station, and that it is very generally agreed that the activities of the small plant manufacturer can in no way harm central station interests; that every farmhouse which has an individual lighting plant is, in itself, an easier prospect for the central station when lines are extended, and that the farm places along the road of such extension are much easier prospects, when they do not have any kind of electric service, if some of their neighbors are already enjoying the benefits of electric light from these individual plants, and that these plants, when the central station service is so extended, are usually connected to the central station service.

PRICE CHANGES

Since your Committee's report of last year, the list prices of vacuum tungsten lamps were changed, namely, on October 1, 1918. On July 1st of that year there was an increase announced in the list prices of gem lamps, but as already stated, this lamp has now disappeared from the market.

By reference to Fig. 5, it is possible to trace the price changes in individual sizes of regular standard lamps, both gas filled and vacuum, with the dates of the commercial introduction of the more important types and the price changes which have taken place to date.

LAMP DEVELOPMENT

During the war period, new development has been necessarily curtailed. Your Committee is advised that the manufacturers are again energetically working on improvements, particularly in the gas filled lamp, and the Committee hopes to be able to make an announcement with respect to this development at an early date.

Mill Type Lamp

For a long time need has been felt for a more rugged high efficiency lamp for application in the few special classes of service in which the modern tungsten lamp has proved to be insufficiently rugged. This was pointed out in last year's Lamp Committee Report, and announcement was made that the manufacturers were engaged in an effort to solve this problem.

Efforts of the U. S. Fuel Administration last year to bring about the substitution of efficient for inefficient lamps directed new attention to the need for a rugged, high efficiency lamp and gave a new impetus to the manufacturers' efforts. The new form of mill type lamp was placed on the market October 1, 1918, and described by this Committee in an article which appeared in the December, 1918, N.E.L.A. BULLETIN. In this form of lamp the

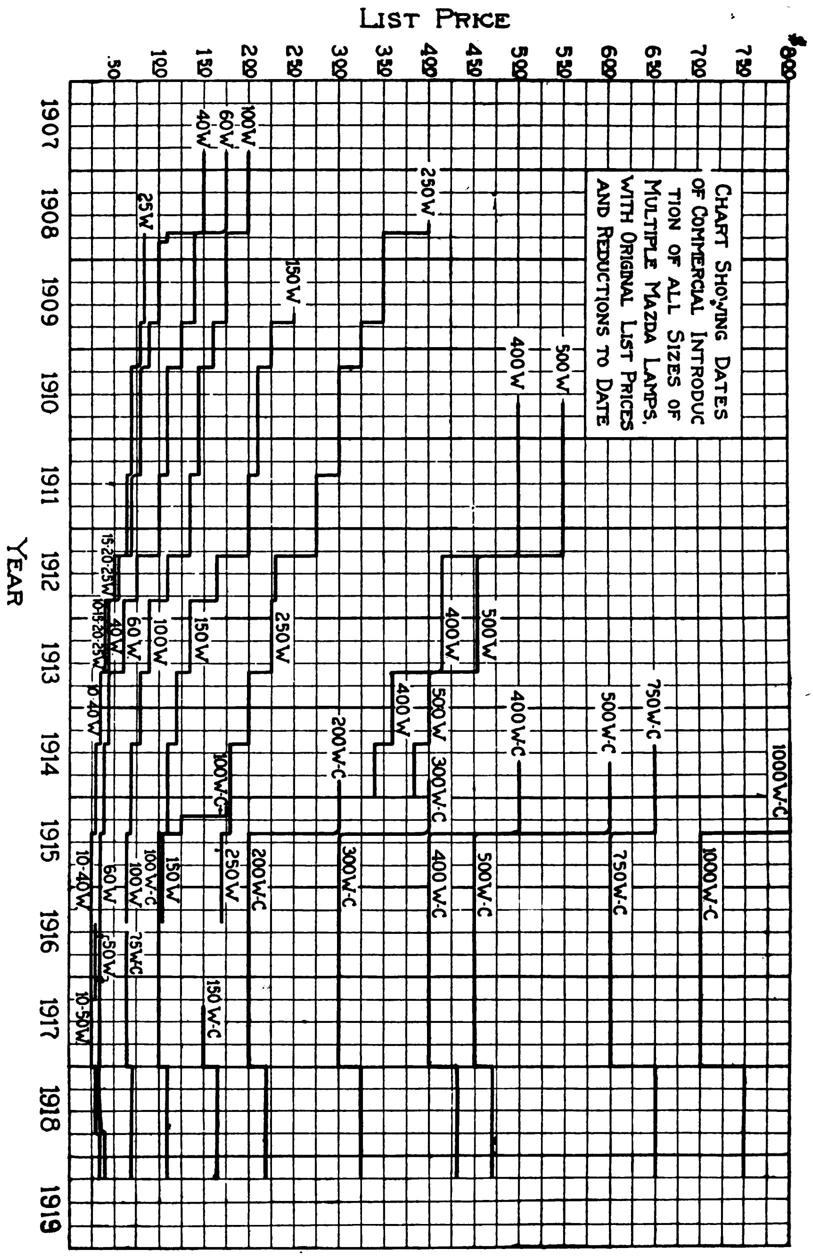


CHART SHOWING DATES OF COMMERCIAL INTRODUCTION OF ALL SIZES OF MULTIPLE MAZDA LAMPS, WITH ORIGINAL LIST PRICES AND REDUCTIONS TO DATE filament mount is flexibly attached to the base by a piece of steel wire in order to absorb vibrations. Each alternate filament leg is attached to an additional anchor to prevent overlapping. These additional anchors cool the filament locally and reduce the efficiency of this type of lamp by about seven per cent.

The mill type lamp in some minor respects is still in the developmental stage. Considerable difficulty was experienced with some of the earliest samples issued for practical service. Some of these indeed proved more fragile than the ordinary tungsten lamps. Means of overcoming such difficulties have been found, however, and the lamp as now produced is well worthy of trial in installations where the requirement is for an especially sturdy lamp.

25 Watt Lamps in S-17 Bulb

In order to standardize the lower wattage lamps in one size of bulb, and to obtain economies in the packing and storage of lamps, the manufacturers have discontinued the production of all 25 watt lamps (except of the 220-250 volt group) in the S-19 bulb, and are now producing this lamp only in the S-17 bulb. It is expected that the change will be completely made and existing stock disposed of by fall.

Lamps for Motion Picture Machines

In your Committee's reports for the past two years, reference has been made to the development of a lamp for moving picture machines, and in the report submitted last year three gas filled lamps which had been developed up to that time, were illustrated. Since then, two lamps have been standardized, one the 600 watt, 20 ampere, 30 volt, T-20 bulb, mentioned in last year's report, and which is recommended only where the throw is short, the screen small and the power supply limited; the other lamp, now standardized and generally recommended, is 900 watts, 30 amperes, in the same size and bulb, and for the same voltage as the 600 watt lamp.

INDUSTRIAL LIGHTING CODES

The establishment of proper industrial lighting rules or codes is of great importance to the industry. This matter has been receiving considerable attention in the past, and much has recently been accomplished. The Illuminating Engineering Society which has been quite active in this work, was called upon in 1913 to assist New York State Legislators in drafting a law to regulate the lighting of workplaces.

As an outgrowth of this work, the Society in 1915, through the joint efforts of its Committee on Lighting Legislation and of its Committee on Factory Lighting, produced a "Code of Lighting Factories, Mills and other Workplaces." Besides stipulations as to distribution of light, shading of lamps, emergency lighting and means for switching and controlling, this Code included conservatively drafted stipulations as to the amount of light required for various kinds of work. The Illuminating Engineering Society's Committee in the course of the preparation of this Code and subsequent thereto, cooperated with the legislators of several States in drafting legislation and preparing State lighting codes in line with the original Code of the Society, and embodying from time to time additional values of intensities of illumination for various classes of work.

A revision of the Society's Code was adopted in June, 1917, and enters to greater or lesser extent into the codes of States which have enacted legislation on this subject, and which have legislation in contemplation. These are the following:

States which Have Enacted Industrial Lighting Legislation

State	Year of Adoption of Intensity Standards	Comment
Pennsylvania	1916	
Revised	1918	
New Jersey	1916	
Revised	1918	
New York	1918	Law containing lighting clause was enacted in 1913, but provided for no lighting intensity standards. Minimum lighting intensities for many classes of work recommended in 1918 and announced to become mandatory July 1, 1919, if approved after reconsideration.

Wisconsin	1918	A lighting code was adopted in 1913, but did not contain intensity stipulations.
Oregon	1919	Law provides for board to recommend intensities, which intensities have not yet been announced.

States which Have Industrial Lighting Legislation Definitely Under Contemplation

State	Comment
Ohio	Very extensive list of intensity recommendations has been prepared.
Massachusetts	
California	Very extensive list of intensity recommendations has been prepared.
Oklahoma	

Several other States have this subject under advisement.

In substantially the form of the Society's latest revision, this Industrial Lighting Code has been further reinforced as to authority and influence by being promulgated by the Committee on Labor of the Advisory Commission of the Council of National Defense and by the United States Bureau of Standards as a part of the Safety Code.

In the several States the codes have been adopted and put into effect under the auspices of the State labor authorities.

The movement for better industrial lighting, of which these industrial lighting codes are an expression, is of immediate interest to central station companies. Adoption and enforcement of such codes means more useful application of artificial light in the promotion of safety and comfort of workmen and in the promotion of economy in industrial plants, both of which tend to confirm the great value of central station service to the community, and, in enhancing the value of that service, tend to increase the company's business. The enforcement of these codes will result at all times in the improved utilization of artificial light, and in many cases an increase in the amount of light used, with resultant advantages to the workman, to the industrial establishment and to the central station.

The Foot-Candle Meter

An instrument called the foot-candle meter recently designed and which has been described in the technical press is being used with considerable success in measuring the illumination intensities commonly found in artificial lighting installations.

The instrument is simple in operation, so light that it may be carried about, and of such size that reading may be taken in very restricted spaces.

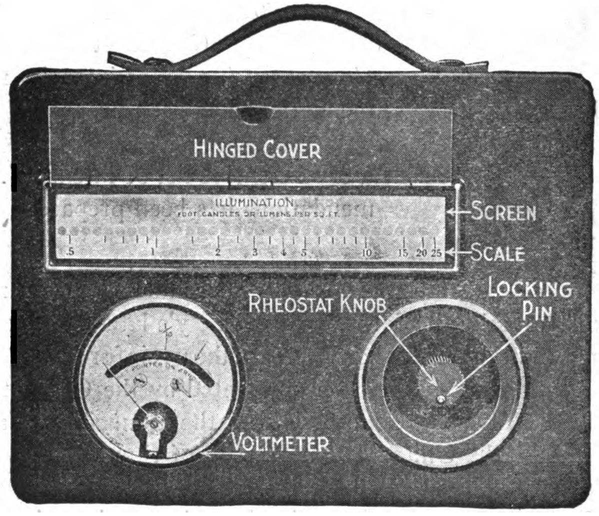


Fig. 6

Fig. 6 is an illustration of the instrument, while in Fig. 7 the same is shown in operation, being placed upon a lathe for the purpose of measuring the foot-candle intensity on the work.

A lamp within the box illuminates the under side of the screen to a much higher intensity at one end than at the other. The illumination which it is desired to measure is, of course, practically uniform over the entire scale. Closely spaced translucent dots, which serve the same purpose as the grease spot in the simple bar photometer, line the scale from end to end. If the illumination on the scale from the outside falls within the measuring limits of the meter (0.05—25 foot-candles) the spots will appear brighter at one end of the scale than at the other, and at

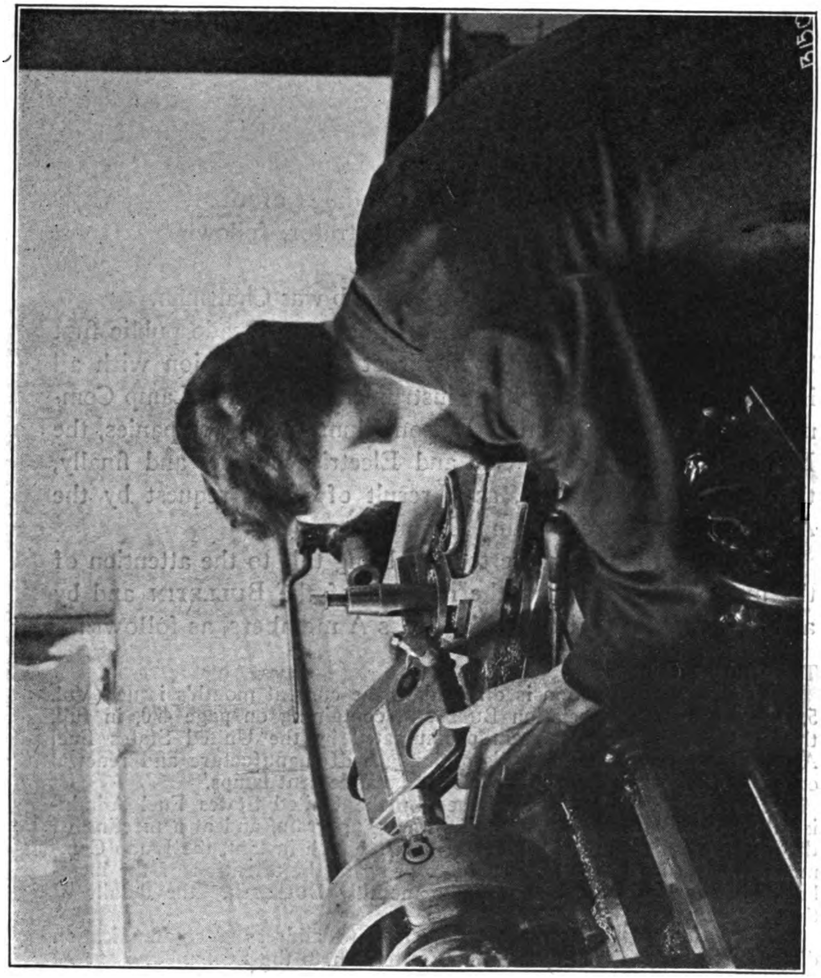


Fig. 7

the point where the spots are neither brighter nor darker than the white paper scale the illumination from within and from without are equal. The scale is accurately calibrated with the lamp within the box burning at a certain definite voltage. A voltmeter and rheostat permit the operator to adjust the lamp voltage to that at which the instrument was originally calibrated. The energy is supplied from a standard 3-cell flash-light battery.

Several of these instruments may be seen in use throughout the Lamp Committee Exhibit.

FUEL CONSERVATION LAMP PROGRAM

For the purpose of the record, it will be of interest to outline the conservation program of the United States Fuel Administrator as applied to the production, distribution, and use of lamps, including carbon and gem. This program, the details of which are a matter of record in the Proceedings of this Association, was promulgated by the Fuel Administrator, following a report (made to and adopted by him) of a sub-committee appointed for that purpose, of which Mr. John W. Lieb was Chairman.

The details of the recommendations were made public first by the Fuel Administrator in direct communication with all interests involved, through the instrumentality of the Lamp Committee of the Association of Edison Illuminating Companies, the National Committee on Gas and Electric Service, and finally, through our Association, as a result of direct request by the Administrator to your Lamp Committee.

Your Committee undertook to bring this to the attention of the membership, through the medium of the BULLETIN and by a direct communication to the Class A members, as follows:

To Member Companies:

Your careful attention is directed to the current month's issue (Vol. 5, No. 8) of the Association BULLETIN, containing on page 470, in full, the fuel conservation program promulgated by the United States Fuel Administration, through the discontinuance of manufacture and renewal of certain types and sizes of inefficient incandescent lamps.

The Association has been asked by the United States Fuel Administrator to lend its aid in carrying out this program, and at a meeting of the Executive Committee held on Friday, the 13th instant, the Lamp Committee was authorized and directed to bring to the attention of the membership, through the medium of the monthly BULLETIN, the details of this program.

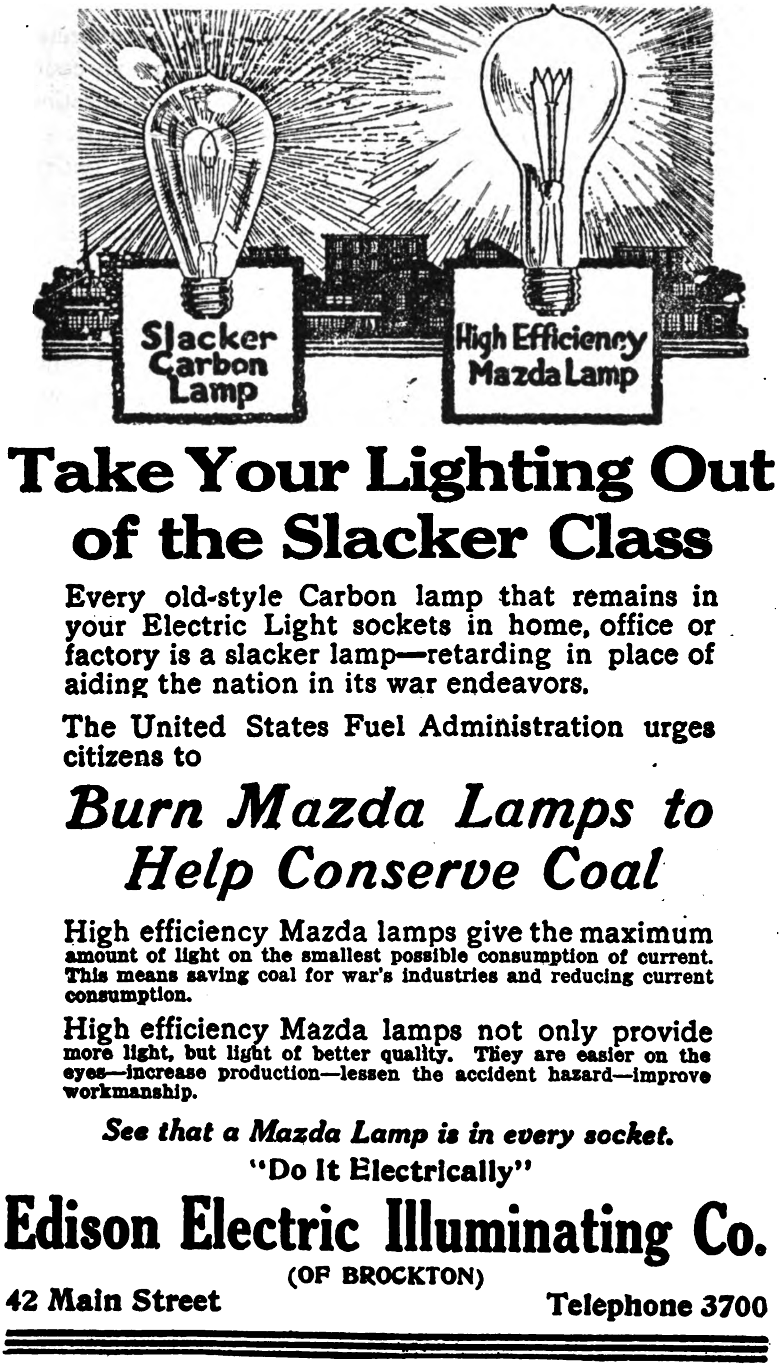
Your Committee was also authorized to address a communication directly to member companies calling attention to the September issue of the BULLETIN and asking for a hearty compliance with the provisions of the program therein set forth.

Please make a careful study of the recommendations made by the Fuel Administrator, and, so far as the same refers to central station companies, undertake to comply therewith in every respect possible.

It is urged that the widest publicity be given the matter either in the daily papers, house organs, or other advertising media, and through your sales organization to make the program thoroughly effective.

Your Committee would greatly appreciate it if you would advise what steps your company will take toward this end, putting us in possession of copies of all advertisements or other data that you may publish or issue on this subject.

Very truly yours,
FRANK W. SMITH, *Chairman.*


Slacker Carbon Lamp
High Efficiency Mazda Lamp

Take Your Lighting Out of the Slacker Class

Every old-style Carbon lamp that remains in your Electric Light sockets in home, office or factory is a slacker lamp—retarding in place of aiding the nation in its war endeavors.

The United States Fuel Administration urges citizens to

Burn Mazda Lamps to Help Conserve Coal

High efficiency Mazda lamps give the maximum amount of light on the smallest possible consumption of current. This means saving coal for war's industries and reducing current consumption.

High efficiency Mazda lamps not only provide more light, but light of better quality. They are easier on the eyes—increase production—lessen the accident hazard—improve workmanship.

See that a Mazda Lamp is in every socket.

"Do It Electrically"

Edison Electric Illuminating Co.

(OF BROCKTON)

42 Main Street **Telephone 3700**

Fig. 8

The response was immediate, and, as might be expected, most satisfactory, the membership, without exception, expressing itself in hearty accord with the program. In communications addressed to your Committee by member companies, many examples were given as to the measures adopted to carry out the requirements of the conservation program. A considerable number of member companies formerly making free renewal of carbon and gem lamps announced their discontinuance of the use of these types. The method employed by member companies in the main was, of course, publicity. The advertising columns of the public press were largely used, and the ordinary method of utilizing house organs, circular letters, dodgers, etc., was widely employed.

The newspaper advertisements were addressed to the abandonment of the metallized filament lamps and the use of the high efficiency lamps in substitution. Such headings as "Don't Use the Slacker Carbon Lamp," "Carbon Lamps and War Regulations," "Free Renewal of Carbon Lamps Discontinued," "Improved Lighting Helps Win the War," "Take Your Lighting Out of the Slacker Class," "Waste not, Want not," were permanently displayed, and show window space was largely used to promote the use of higher efficiency lamps and draw comparisons between these newer types and the "old-fashioned and wasteful" carbon lamp. A good example of these advertisements, addressed to the discontinuance of the carbon lamp, is here reproduced. (Fig. 8.)

The Society for Electrical Development, cooperating with the National Committee on Gas and Electric Service and with your Lamp Committee, issued and widely distributed for the use of central stations, jobbers, dealers, and others, a booklet 9 by 12 inches, containing twelve suggested pieces of advertising copy on this subject addressed to the public.

With the signing of the armistice, November 11, 1918, the Fuel Administration expressed the opinion, through the National Committee on Gas and Electric Service, that this act did not terminate the existing state of war between the United States and Germany; that it did not put an end to the necessity of economies in fuel, and that the Administration saw no reason for withdrawing its approval of the program for the limitation of the production and distribution of carbon and gem lamps, and that the restrictions created by this program should be continued in effect until further instructions.

Effective January 1, 1919, and as approved by the Fuel Administration, the voluntary restrictions and limitations placed upon the production and distribution of inefficient incandescent electric lamps were abandoned. As to our help in this work, your Committee has received an expression of thanks from the Fuel Administration for the cooperation given by the Association.

COMPANY LAMP POLICY

It will be remembered that in the 1917 report the Committee presented in considerable detail the results of a survey made among the Class A membership as to the methods followed in handling lamps. This presentation was based upon the information received at that time from 40 per cent of the membership,

This year your Committee has undertaken to recanvass the members with a view to ascertaining the changes, if any, which have since taken place, and to report, so far as possible, full and complete information from Member Companies as to their present practice with respect to the incandescent lamp situation. This year, 50 per cent of the Member Companies have reported, the replies covering practically every state in the Union. The maximum number from any one state was 46 (New York), the average per state, 10, while 11 states returned replies in excess of this average. The Committee feels that the conclusions reached from the replies received, may be considered as representative of the industry.

It was found from an analysis of the replies that they could be divided into four classes; namely, (1) companies merchandising only, (2) those which merchandise and furnish free renewals, (3) those which furnish free renewals only, and, (4) those which do not handle lamps in any manner whatsoever.

Included in the class (2) "merchandising and furnishing free renewals," are those companies furnishing certain types and sizes of lamps on free renewal, with a differential price to renewal customers for types of lamps not included within the renewal schedule.

TABLE 8

Number of Central Station Companies Reporting Various Lamp Policies

Figures Indicate Number of Central Station Companies

Company Lamp Policy	Number of Lighting Consumers Supplied											
	Less than 1000		1001 to 5000		5001 to 10000		10001 to 50000		Over 50000		Total	
	1917	1919	1917	1919	1917	1919	1917	1919	1917	1919	1917	1919
Free Renewals Only.....	0	0	0	2	1	0	1	0	0	1	2	3
Merchandise Only	112	108	116	166	23	52	16	37	2	10	269	373
Free Renewals and Merchandise	15	3	56	18	25	7	28	7	8	6	132	41
Do Not Handle Lamps...	4	25	12	20	2	4	3	8	0	0	21	57
Give Renewals — Make Lamp Service Charge..	0	0	0	0	0	0	2	0	2	0	4	0
Total	131	136	184	206	51	63	50	52	12	17	428	474

TABLE 9

Central Station Companies Reporting Various Lamp Policies

Figures indicate per cent of companies reporting in each group

Company Lamp Policy	Number of Lighting Consumers Supplied											
	Less than 1000		1001 to 5000		5001 to 10000		10001 to 50000		Over 50000		Total	
	1917	1919	1917	1919	1917	1919	1917	1919	1917	1919	1917	1919
Free Renewals Only.....	0	0	0	1	2	0	2	0	0	6	1	1
Merchandise Only	85	80	63	80	32	83	32	71	17	59	63	79
Free Renewals and Merchandise	12	2	31	9	56	11	56	13	66	35	30	8
Do Not Handle Lamps...	3	18	6	10	6	6	6	16	0	0	5	12
Give Renewals — Make Lamp Service Charge..	0	0	0	0	4	0	4	0	17	0	1	0
Total	100	100	100	100	100	100	100	100	100	100	100	100

The 1917 grouping as to size of companies has been repeated this year, namely, under five sub-divisions, according to the number of lighting customers served—1,000 or less, 1,001 to 5,000, 5,001 to 10,000, 10,001 to 50,000, and more than 50,000. A complete analysis of the replies has been made, the entire detail of which would be too voluminous to include within the body of this report. The Committee has, therefore, undertaken to show in the lighting exhibit conducted under its auspices as a part of the general exhibit of the Association, the central station lamp practice by tables, graphic illustrations, etc.

In the booth devoted to illustrating company lamp practice, it is believed all of the necessary detail will be found, and the complete "Answer" given as to the replies submitted by member companies.

In order to summarize certain of the information for the purpose of this report, three tables are here presented, Table 8 being a comparison (1917-1919) of the number of central station companies reporting, arranged according to the policy classification above given.

Table 9 repeats this information by comparing the percentage of the companies reporting for the two periods, it being necessary to show the comparison by percentages because of the variation of the number of companies reporting for the two periods.

The information gathered shows a tendency towards merchandising among companies of all sizes. An examination of Table 9 shows that while in 1917 63 per cent of the companies reporting were on a strictly merchandising basis, this year 79 per cent of the companies reporting are so operating.

In 1917, 30 per cent of the companies reporting were operating on the basis of "merchandising and free renewals." This year but 8 per cent so reported, 16 per cent discontinuing free renewal and adopting a strictly merchandising policy, while 6 per cent discontinued entirely the handling of lamps. A detailed study of the table will show the changes in policy among the companies of each group, as to number of lighting customers supplied.

The change in lamp policy, with the tendency toward merchandising, has been a slow but rather steady development, and has, no doubt, been somewhat accelerated during the past two years by the war.

There are still many notable examples of the free renewal policy, and your Committee expresses no opinion as to the wisdom of this or that lamp policy which may be followed by the individual company, as it is too largely a local matter, and no one is as well qualified to determine the policy best suited to the individual local conditions as the company itself.

Among those companies merchandising and furnishing free renewals, there are still a very few furnishing carbon lamps for free renewals. The number of companies has, however, been considerably reduced since 1917, and upon further inquiry since the questionnaires were sent out this year, it has been found that several of these had already eliminated this service, and that the few remaining have the elimination of the carbon lamp in mind, or in process of elimination.

With respect to the use of the gem lamp, which, as already stated, has disappeared from the market, 83 companies reported using this type of lamp for first installation or renewal in 1917, while but 3 companies so reported this year. With the satisfactory development of a more sturdy filament lamp of the tungsten type, as previously referred to, suitable for special applications where it has been thought the carbon lamp was necessary, it may be expected that the use of the carbon lamp will entirely disappear.

Reference to Table 10 is made as to variation in company policy under the two classifications given, with respect to sale price of lamps.

TABLE 10

SALE PRICE

	Companies which merchandise only		Companies which merchandise and give renewals	
	1919	1917	1919	1917
At list	72%	57%	49%	42%
Less than list	11%	24%	22%	28%
At list and miscellaneous combinations	17%	19%	29%	30%

NEW CHANNELS OF LAMP DISTRIBUTION

In view of the trend toward the general merchandising of lamps, the Committee feels that it would be interesting to direct attention to the new channels of distribution that are coming into existence.

Where Member Companies have adopted the policy of merchandising lamps, it is suggested that they participate, so far as may be possible, in any organized effort to supervise the distribution of lamps to their customers, seeing to it that the customers are provided with complete and full information as to lamp development and that the highest grade of lamps possible to obtain be made available.

The following description of the manufacturers' efforts to meet the new conditions of distribution will be of interest.

Appointment of Lamp Agents

Retail merchants are appointed as lamp agents in sufficient number to insure adequate retail representation for the manufacturer and at the same time provide convenient sources of supply to the consumer. Preference is given to the electrical contractor-dealer and to the hardware store, but in localities where such representation is lacking, other merchants are appointed as a matter of convenience to the consumer.

Development of the Agent

This embraces a variety of activities on the part of the manufacturer and may be briefly described as follows:

(1) *Educational.* This is carried on through the medium of: (a) providing the agent at the time of appointment with specially prepared booklets and other printed matter describing in elementary fashion the tungsten lamp and its proper application, emphasizing particularly the importance of selling proper size and voltage lamp; (b) personal calls made at frequent intervals by manufacturers' representative; (c) lectures given by manufacturers' representative at meetings of contractor-dealer associations; (d) manufacturers' sales promotion magazines mailed monthly to agents.

(2) *Advertising.* Material of a character best suited to the requirements of the retailer has been designed, and consists principally of the following:

(a) window displays of high quality furnished periodically and so timed as to tie up with manufacturers' national advertising; (b) literature, such as blotters, fliers, circulars, etc., with agent's imprint thereon furnished automatically and on request.

(3) *Sales Promotion.* Aid is given agent in connection with (a) drawing up of circular letters; (b) proper use of window displays; (c) general deportment of store and effective display of goods.

CENTRAL STATION COOPERATION

On the occasion of the adoption of the merchandising policy by three representative companies in the east, the lamp manufacturers were called into consultation with a view of developing plans whereby the three branches of industry could work together in such a way as to preserve proper standards and practices, and to assure the proper distribution of lamps. In announcing their new lamp policies, representatives of these companies appeared before representative bodies of contractor-dealers and explained to them the importance to the industry and consuming public alike of the retailer carrying on his operations in accordance with what is considered good practice. This has been followed up from time to time through the medium of special committees consisting of representatives of the manufacturer, the central station, the jobber and the dealer. Great consideration is given on all such occasions, among other things, to the question of selling lamps of the proper voltages. In this connection the manufacturer, in placing consigned stocks in the hands of retailers, takes care to see that lamps of a voltage suitable to the community are furnished.

As a means of further precaution in the matter of proper voltage distribution, these companies are about to adopt the use of a tag furnished by the manufacturer to be placed on all meters or service entrance as the case may be, calling the consumer's attention to the voltage lamp that should be purchased for his service. Figure 9 illustrates this voltage identification tag. The consumer's interest will be concentrated on this device through the medium of specially designed local advertising, particularly in the way of fliers, blotters, etc., to be distributed through retailers and through the Member Companies interested, carrying the message that the consumer should consult the voltage tag on meter before purchasing lamps. Another method adopted by one of the large manufacturers is to distribute among dealers and agents a map on which is indicated the proper voltage for certain districts or areas supplied by the several companies.

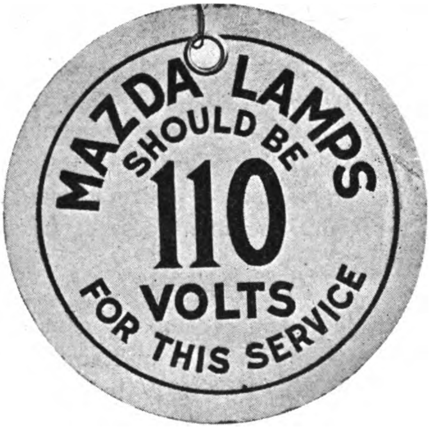


Fig. 9

Forms of Lamp Contract

The forms of contract now offered by the manufacturers are substantially the same as last year, no important changes having been made.

As to the form of contract most desirable for Member Companies to enter into with the manufacturers, the local conditions which are factors in determining local company lamp practice will, of course, control this situation. In general, it is thought desirable by your Committee that where central station companies furnish lamps as a part of their service or in connection with their rate for current, as a feature of such service they may find it desirable to adopt a central station purchase contract, but where central station companies merchandise lamps not as a part of their service nor in connection with their rate for current, as a feature of such service, it would appear desirable that they adopt the regular agency consignment contract used for the commercial distribution of lamps.

The Committee feels that with the trend toward the general merchandising of lamps, where central station companies, due to their local conditions, find this policy to their best interests, every effort should be made to cooperate with the contractor-dealers and other distributors, so that they may acquire greater stability and become potential retailers of incandescent lamps as well as other electrical appliances, and that the central station company, operating under such a policy, should take an active part in conjunction with the manufacturer in supervising the distribution of lamps.

CONCLUSION

The list of those member company committees and individuals who have cooperated with your Lamp Committee in the preparation of this report and particularly in producing the lamp exhibit, is a lengthy one. The Committee has had invaluable aid from many sources, and to all who have been helpful in the work, it expresses appreciation.

Respectfully submitted

FRANK W SMITH, *Chairman*
DOUGLASS BURNETT
WALTER CARY
E R DAVENPORT
W W FREEMAN
W H JOHNSON
J P MACSWEENEY
G F MORRISON
J T MOUNTAIN
F S TERRY

MR. SMITH: I wish I might take time to tell you something in detail of the splendid work of these young men representing the lamp manufacturers, in the preparation and completion of this exhibit. It has been an inspiration to work with them, and I wish I might be able to tell you something about it. (Applause.)

THE PRESIDENT: I will ask Mr. John Howell to open the discussion on the Lamp Committee Report.

John W. Howell, Newark, N. J.: The first thing in the Lamp Committee's Report is a reference to the lighting exhibit, and I think it is very well placed—right at the beginning of the report, for it is a very important piece of work.

There are two ways of acquiring information: first, the intellectual method, which is by reading and study; and second, the method by observation, by the use of the senses.

A great many more people can acquire information through their senses than through their intellects; and most of us can acquire it more easily by observation than by study. I have been through that exhibit very carefully and it is well worth the study and observation of everybody in this room. I congratulate the Lamp Committee, and especially the sub-committee on that work.

As an illustration, consider the foot-candle meter, described on pages 252 and 253 of the report. How many of you have read that carefully and digested it, and know what a foot-candle meter is, and how it is operated from reading the report? Very few; but if you go to the exhibit and see it in operation, and have it shown to you, and work it yourself, you have a knowledge which will never leave you.

That illustrates the advantage of an exhibit over a purely literary description.

The Lamp Committee, as you know, is composed of representatives of the lamp users, the big central stations, and of the lamp manufacturers. It is the means of cooperation between the makers of lamps and the users of lamps, and it is a very important medium of cooperation. If you notice the summaries which are contained in this report, showing the progress made in lighting during the ten years which have passed, you will see a record of the work which was possible only by that cooperative agency between the manufacturer and the users of lamps. For instance, take the table on page 240, which shows that in 1918 the 20-watt type of lamp disappeared—it was eliminated. As there are a great many lamp customers, with varying requirements, and several manufacturers producing various types, the natural tendency in making lamps is to multiply the types.

Through this cooperative committee we were enabled not only to keep down the number of types of lamps, but even to eliminate some, and I think there might be further elimination.

Take the 40, 50 and 60 watt lamps: they are too close together, they require an unnecessary amount of manufacture and stocking of lamps, and the more the manufacturer can reduce the different varieties of lamps which it is necessary to carry in stock the better it is for the whole industry.

The third table on page 241 shows for the ten years that have passed the maintenance of the average watts, which is a thing we were all afraid of ten years ago. That important result was made possible by the cooperation between the manufacturer and user, and, without some such agency as the Lamp Committee, I doubt if it could have been accomplished.

Take also the figure on page 245, showing the distribution of lamps by voltages. That is an important result and was achieved by years of work of the Lamp Committee. You notice in the table that there are no 109 and no 111 volt lamps used. That curve in the old days used to show very little variation, but of course there was a peak, and now the lamps seem to be confined to the 110, 115 and 120 volt types, which is a great economy. It is standardization, and has been brought about by the Lamp Committee.

We all know that the conditions of the past two years have not been favorable to good manufacture or development. There has not been very much development, and I am sorry to say that the manufacturing conditions have not been as satisfactory as we hope they will be in the future.

The reference to lamp development on page 247 refers, I think, to the lamp which has been shown quite freely in the Lamp Exhibit—the 50-watt type lamp in the opal bulb. There are two radical changes in that lamp. In the first place, the use of an opal glass, a natural blown glass, which gives a diffusion of light so that the light apparently comes from the whole surface of the bulb instead of coming from a concentrated filament. That is still somewhat of an experiment, although pretty well developed, and if that lamp can be manufactured successfully, so we can get a uniform distribution in that glass, I think it will be a very useful lamp. I believe, however, that most lamps will continue to be made in clear glass, because most lamps should be used where they are not visible and when they are not visible there is no use in making them of opal glass.

The tipless feature of that lamp is an important and radical departure to show in public as a lamp we are willing to make and sell, because when we show the lamp here we mean we are able to make it commercially. There has been a steady request for tipless lamps ever since the industry started, and I think this is the first time the large companies have said that they are ready to manufacture them. Of course, the construction is more expensive than the other, but if its popularity is sufficient and people are ready to pay the extra price for it, it will be seen in all types of lamps some day.

THE PRESIDENT: I will call on Mr. Louis A. Ferguson.

LOUIS A. FERGUSON, Chicago: I do not want to stir up an argument, but it has come to me directly and indirectly that there is considerable discussion in this country on the continuance of the policy of free lamp renewals and the control of lamp service by central station companies. We have heard that jobbers and electrical contractors are anxious to get hold of the merchandising sale of lamps and that there is a real question whether our companies should swing to such a merchandising basis.

We have been operating a successful business in Chicago for some thirty years. We have paid dividends during that time without interruption, and we continued to do this even during the war. The same has been done in other cities, and one of the fundamental reasons in my opinion for our success in the industry is the close contact we have maintained with the customer. The principal point of that contact is through the lamp renewal policy, through the delivery of lamps, free, or on an exchange renewal basis, and I think it would be a great pity for those successful companies which have followed that policy now at this late day to change to the merchandising basis and put the business in the hands of anybody looking to make a profit out of our customers.

I know there is this under-current throughout the country toward getting the renewal lamps out of the hands of the central station companies, and I want, at this time, to register my protest against such a movement, whether it emanates from manufacturers of lamps, from supply dealers, or from any other source. I want to advise the central station companies not to listen to that propaganda, but to stand firm on the basis which has contributed so much to their success.

There are several reasons why all of us should do this. First, looking at it from the customer's standpoint: he is better off dealing with the central station company because that company has his interest at heart. The company does business with him all the time, while the hardware store or supply man has no interest outside the profit on the sale of a lamp. As is shown by investigations of cities where the merchandising policy prevails, the merchandising dealers care little what kind of lamps they sell, whether efficient or inefficient, whether of the proper size or not.

Looking at it from the standpoint of the central station company: if you allow the indiscriminate sale of lamps by incompetent parties, your wattage will certainly go down and necessarily your income will also decrease, in most cases very seriously. I know of one very large company where the average wattage of lamps put out by the central station has decreased about 25 per cent as a result of the change from the free renewal to merchandising policy. If we should suffer that same thing in Chicago our income would decrease to such an extent as to wipe out entirely our surplus and impair our dividends. These facts, it seems to me, show just how important it is for us to see that our customers are taken care of competently in their lamp service and that, at the same time, we look after ourselves.

THE PRESIDENT: Mr. Johnson.

WALTER JOHNSON, Philadelphia: I desire to endorse heartily everything Mr. Ferguson has said.

ARTHUR WILLIAMS, New York: Mr. President and Members of the Convention, I do not want to take a position which might seem to oppose the views expressed by Mr. Ferguson, because I have learned to respect any attitude taken with reference to our industry by one of Mr. Ferguson's experience and understanding and broad knowledge of the industry.

I am mindful of the fact also that one company can pursue one policy and another another, and yet each under local conditions would have the best policy for the local situation, for the company, and for the public.

Perhaps the New York company offers an illustration of the most recent change in the matter of lamp policy. I know of no other company which has done this in the past year or two as completely as the New York company has. And I think it will be accepted that the change was not made until after due process of reason and as the result of careful study.

Going back for some twenty-five years—it was about twenty-one years ago—I went abroad as a member of the New York Company's Engineering Commission. Mr. Lieb was its chairman and Mr. Van Vleck and myself were the other members. We were given a chance to study the difference in European lamp practice and our own, and came back convinced that the practice of the American companies in supplying free renewals gave them their great prosperity; we felt that the American practice of free lamp renewals, which was diametrically opposed to what was in vogue in Europe, was profitable to the companies and to the public, and we were unanimously committed to that policy.

But I would remind you that at that time there were many different kinds of lamps and many efficiencies and materials out of which they were made. Today we have practically one lamp, made under certain standards, and, through what I consider to be a very splendid educational program on the part of the manufacturers, a larger degree of public education on the subject of lamps, and that education is growing.

The public familiarity with the tungsten lamp through the advertising activities of the larger manufacturers has changed that whole question of lamp ignorance into lamp knowledge or acquaintance, with practically uniform lamp quality, efficiency and life in the tungsten lamp. In New York City we are faced with constant agitation against our maximum rate. If the lamp renewal is made in the rate (the customer is paying for it in any event) the maximum must be higher; our thought is to keep the maximum as low as consistent with good service and fair profit. If lamp service can be kept out of the rate, it would seem a good thing to do.

There is no criticism as to the lamp policy followed in any other community. As a matter of company policy we have developed as many selling electrical centres of service in New York as possible. We have for many years encouraged the individual contractors.

We want every convenient point to be an electrical supply centre. That was one of the considerations which led to this lamp change. We were anxious to make as many profitable electrical centres as we could. As a result there are, perhaps, one thousand centres in New York where customers buy the standard mazda lamp.

Now, another factor which led to this change is that where the price for current includes the supply of lamps the customer is charged for the lamp in the current he uses for his devices. In the next two or three years our largest growth will come from the use of electrical devices in the home, and in the substitution of central station service for private plants. There are about two hundred million dollars' worth of buildings on the drawing boards of the architects' offices, but they are not being erected and cannot be for some time. A recent survey of one thousand apartments at random showed that 44 per cent were using electrical devices of one kind or another, and that 54 or 55 per cent of the wattage equipment was in the devices and less than one-half of it in the lamps. I mention that to show the growing importance of the service and also the importance of taking out of the price of current the cost for the lamp, which would otherwise be charged against that branch of the service.

I am of the opinion that too much credit cannot be given to the leaders of our industry and to this Association and to the Edison Association for our lamp development in the past, and for what they have done in cooperation with the manufacturers, and for what the manufacturers have done in cooperation with our industry. I believe at the bottom of our great industry lies this question of lamps. While I feel in New York we would take no backward step, I also feel it is a subject which should have very careful consideration by our membership.

THE PRESIDENT: Discussion of the Lamp Report would not be complete without hearing from Mr. John W. Lieb. I will read two telegrams which have been received from him.

WALTER F. WELLS, President.

Please accept my very best thanks for cordial greetings conveyed on behalf of National Electric Light Association, which find me on high road to recovery. I extend my best wishes for a most successful convention.

John W. Lieb.

(Applause.)

The other one is:

F. W. Smith, Chairman, Lamp Committee, N.E.L.A.

I desire to express my appreciation and thanks for the good wishes expressed on my behalf by the Lamp Committee and representatives of lamp manufacturers; and convey my congratulations for a most successful convention.

John W. Lieb.

(Applause.)

The President: The Lamp Committee Report is still open for discussion.

S. B. Cushing, Chicago: I am with the Public Service Company of Northern Illinois. We recently made a survey of our lamp situation, and that study calls my attention especially to page 241 of the Report of the Lamp Committee, which shows the percentages of various types of lamps.

Attention was called to the fact that the 50-watt lamp had increased 30 per cent during the last year and that the 60-watt lamp had increased only 3 per cent.

At first thought this would indicate that the 60-watt lamp was being very much displaced by the 50-watt lamp, due to the natural desire of the public. This, however, is not always the case, because prices in many cases are so regulated that the public is taking a 50-watt lamp in preference to a 60-watt lamp, or it may take a 50-watt lamp in preference to a 40-watt lamp.

However, this report does indicate that that practice is warranted by the large increase in the average wattage. This average wattage in our particular company, I believe, was 49.7 watts, which corresponds very closely with this report. I want to bring out this question of percentages in particular as it is effected between various companies by the policies which those companies pursue.

I think that one of the greatest mistakes of lamp manufacturers in the past—possibly during the last few years—has been the manufacture of so many sizes of lamps; and I believe the time will come when we will have to limit ourselves to seven sizes of incandescent lamps—that is, the 15-watt, 25-watt, the 50-watt, the 75-watt and possibly three sizes above that.

I am glad to see that the 20-watt lamp has been wiped off the slate, and I believe either the 40- or 60-watt should also be abandoned. (Applause.)

R. H. **Ballard**, Los Angeles: We are attempting in California to solve this lamp question, as well as the other so-called merchandising questions, through a general plan of cooperation as between central stations, jobbers, manufacturers and contractor-dealers. That plan, which is no printed plan, but a real down-in-the-heart spirit of cooperation, has developed to a point where we believe it solves this difference of opinion on lamp questions.

All California companies have discontinued the practice of furnishing lamp renewals free, and have, in cooperation with the jobbers and the contractor-dealers, established a service which so far, after six or eight months' trial, has proved very satisfactory.

We did not feel we should go out of the lamp renewal game suddenly and without any preparation on the part of other branches of our electrical industry, but the matter was given very careful attention. There were many conferences held between the different branches of the industry, and the question of service in the furnishing of lamps predominated. An enthusiastic working arrangement is now in effect, and we are getting good results from the standpoint of income as well as service to the consumer by allowing the contractors and jobbers and dealers to handle the lamp situation.

M. S. **Seelman**, Brooklyn: Mr. Ferguson made the statement in his lamp talk that in companies where the change had been made from free renewal to a merchandising basis the result had been a reduction in the average wattage of the system. Now, this is very important if true.

My impression from familiarity with some of these situations and conferences with lamp manufacturers is the reverse of this statement.

I would like to ask any of the lamp manufacturers who may be present, and who may have statistics, to enlighten us on this very significant phase of the situation.

S. Ferguson, Hartford, Conn.: I wish to endorse heartily the remarks of Mr. L. A. Ferguson relative to the desirability of maintaining the policy of free lamp renewals at least to the extent of free renewals where the cost of the lamp does not exceed 10 per cent of the revenue received from the lamp during its life, as is the case with 40-watt lamps and larger.

In addition to the very good reasons already given by Mr. Ferguson for this policy, it is certainly desirable to comply with the customers' wishes, which are strongly in favor of a rate which shall cover renewals and thus avoid the frequent petty charges for lamps. In either case, the customer pays, which fact should always be frankly admitted.

A second point to be considered is the effect of lamp charges on the question of keeping the lamp sockets filled. During the two months last fall when at the request of the Fuel Administration a charge was made for lamps previously renewed free, the total demand for renewals of all sizes fell off in Hartford over 10 per cent, and did not return to normal until the charge was removed.

It has been stated that the use of small lamps was just as prevalent when all were sold at list as when the 40-watt were renewed free. The experience in Hartford during the two months above referred to was the reverse. Normally, three small lamps are renewed to seven of the larger sizes. During the period that both 25 and 40-watt lamps were charged for, the demand changed to five small against five large, returning again to the former figures as soon as the charge for the 40-watt was removed.

I would also call attention to the figure in the report of 24 per cent of lamps manufactured as being 40-watt. The percentage used in Hartford is 46 per cent.

W. H. Rolinson, New York: There is nothing which I can add to Mr. Smith's report in the way of statistics which would be of value, for, as in previous years, the report in itself is complete from this standpoint. There are certain other features, however, which it is thought well to emphasize and perhaps to some extent expand.

As pointed out in the Committee's report, lamp development during the war period was considerably curtailed, at least in its commercial aspects, although there was considerable development of special forms of incandescent lamps for war purposes. The manufacturers, however, are now directing considerable effort to the matter of lamp development. The mill type lamp, or more rugged form of vacuum tungsten filament lamp, is one of the examples.

The mill type lamp as at present constructed has been found to be a rather satisfactory substitute for carbon and gem filament lamps in many of the places where a sturdy filament lamp was essential, and some limited use of these lamps has been made in portable lamp service with satisfactory indications. There are possibilities, however, for a further increase of the strength and ruggedness of this lamp, and it is thought that by the time the incoming Lamp Committee makes its report next year an even more rugged form of mill type lamp than that now produced will be available.

It may be of interest in passing to note that the present style of mill type lamp is not only produced in 110-volt range but also in the 220-volt. Some few installations of the 110-volt type of lamp in street railway service have proved very satisfactory and the possibility of this lamp for that service seems to have a rather bright future. The mill type lamp of the 200-volt range has also been subjected to trial in coal mines and other classes of mines with rather satisfactory results.

A great deal of time is being devoted by the manufacturers to the development of more rugged types of lamps. This development applies to the entire line of lamps manufactured, as well as to some of the more specific sizes. Certain experimental designs of more rugged forms of Mazda C lamps have been developed which give considerable promise. Mazda C lamps in themselves have not been what may be termed fragile in any sense, but there seem to be practical means of increasing the sturdiness of this lamp, and I therefore look forward to some development of this character within the next year.

The 50-watt Mazda C-4 lamp of white glass bulb, which is exhibited in the wonderful display of the Lamp Committee, should be of considerable interest to the central station companies. This lamp with its non-glare characteristics and pleasing color should find a welcome field in homes, in connection with portable table and stand lamps and for other decorative purposes. It is not unlikely that the use of this white glass may be extended to other sizes of Mazda C lamps; certainly to lower wattage Mazda C lamps when it is found practicable to produce such lamps of reasonable quality. There is no indication, however, at this time of the production of a lower wattage lamp than the 50-watt Mazda C-4 which has been presented to you.

Your Committee report briefly mentions the development of rural lighting plants. It may be of interest to the central station members to note that there are approximately 200,000 of these plants now in operation and that conservative estimates indicate that new installations of these plants are being made at the rate of approximately 100,000 per annum.

Your Committee has briefly mentioned the motion picture lamp, and it may be of interest to state that practically all of the manufacturers of motion-picture machines have placed on the market rather satisfactory devices for projection of motion pictures by incandescent lamps. The apparatus is fitted with a transformer for converting the energy from 110 volts to 30 volts, 30 amperes being required by the lamps, where proper systems of direct current are made available. It is felt that there will be a considerable number of changes in existing motion-picture theatres from the present arc lamp equipment to incandescent lamp equipment; but the largest field, and the one which appears to be the most attractive, is that of schools, colleges and churches. Establishments of this character have not been able heretofore to use motion pictures with convenience on account of the difficulties attendant upon the arc lamp. With the incandescent lamp much of this annoyance has been removed, and the motion-picture machine people and incidentally the lamp manufacturers look forward to quite an extensive business in this direction.

Certain of the lamp manufacturers have devised new methods of packing incandescent lamps which are thought to be of interest to the central station people. This style of packing, with four trays, in the standard sizes of lamps, of 25 lamps each—100 total in the container—with each lamp wrapped individually, possesses the following advantages:

Tests made at the Forest Products Laboratories of the Department of Agriculture and comparable tests run at the works of the lamp manufacturing company indicate that approximately 30 to 50 per cent less breakage in transportation is experienced.

The size of the container and the total weight are approximately 30 per cent less than those now standard.

The package contains no excelsior, is solid, and for this reason shipments should stack more satisfactorily.

The individual wrapping of each lamp should facilitate deliveries of odd quantities of lamps by the central stations to their customers, which upon investigation seems to be the usual procedure.

MR. SMITH: On behalf of the Lamp Committee, permit me to say that we appreciate the time you have given to the presentation and discussion of its report.

The Lamp Committee for the past twelve years, during eight of which the speaker has had the honor of being Chairman, has been most careful to refrain from including in the report any exact recommendations to member companies as to lamp policy. This has again been emphasized in the report this year at the top of page 260. The general information obtained by a very careful analysis of the questionnaires turned in by the companies and here reported simply shows the facts as they exist and the tendency on the part of the industry in the matter of lamp policy.

No one is more appreciative of the fact than the speaker that the Commonwealth Edison Company, as stated by Mr. Ferguson, has been a most successful company for a period of thirty years, and while I have no doubt that the lamp policy as outlined by Mr. Ferguson is a material factor in this success, I feel that nothing has had so much to do with that success as the ability and high character of the personnel of the company. (Applause.)

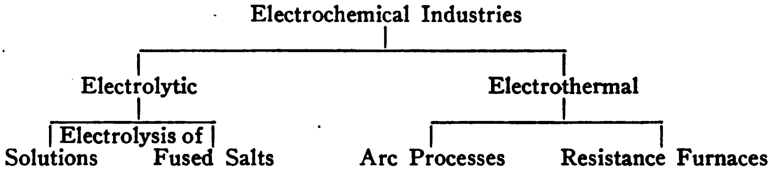
The figures as to the distribution of lamps indicate that a general change of company lamp policy throughout the industry, whatever that change might have been, has not had the effect of reducing the average lamp wattage. This fact is clearly brought out in Table 5 on page 241, as well as elsewhere in the report. The average wattage of lamps sold continues to be on the increase.

THE PRESIDENT: We will now have an address entitled "The Electro-Chemical Industries," by Prof. Joseph W. Richards, Lehigh University, Secretary of the American Electro-Chemical Society. The metallurgical and chemical industries are becoming more and more closely connected. Prof. Richards was for two years connected with the Naval Consulting Board and is now Chief of the Department of Metallurgy of Lehigh University. It gives me great pleasure to introduce Prof. Richards.

THE ELECTRO-CHEMICAL INDUSTRIES

By Joseph W. Richards*

I deem it a great opportunity to be able to speak to you about electro-chemistry, and as the Secretary of the American Electro-Chemical Society I cannot escape the suspicion that in accepting this invitation I may have been doing something to forward the interests of that Society. However, that is incidental; my chief purpose is to give a bird's-eye view of what electro-chemistry is and in what fields it is working, and somewhat of a survey of the electro-chemical industry.



I will speak first of the general field of the electro-chemical industry. The chemical industries deal with the problem of taking the raw materials of nature and making them more valuable. I will give you an illustration: Take common salt, which costs about $2 a ton as it is taken out of the mine; and we convert it into caustic soda and chlorine, about half a ton of each, which are together worth $45 or $50. Take common water, and we convert it into hydrogen and oxygen; each of which has a considerable commercial value. Take the air, oxygen and nitrogen, and by means of electrical arc processes we cause the oxygen and nitrogen to combine to nitric acid.

These are samples taken at random of how the raw materials of nature are converted by chemical operations into more valuable materials for commercial use.

Metallurgy is one of the branches of applied chemistry. The function of the metallurgist is to take ores in which the metals occur in nature and extract from them the metals so that they may be usefully applied. When in the course of metallurgical operations you use electrical current, either for its electrolytic or its electro-thermal power, you have an electro-metallurgical operation. As illustrations of this, it is possible, and in some few countries profitable, at the present time, to make pig iron from iron ore by means of the electric furnace. It is almost everywhere profitable to refine impure copper into pure copper by means of an electrolytic operation.

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*Professor of Metallurgy, Lehigh University, and Secretary of American Eletcro-Chemical Society.

We may therefore say in general that electro-chemistry deals with using electric energy to convert the raw materials of nature into more valuable materials, such as extracting metals from the ores, refining the metals, and similar operations which render them of increased value.

The electro-chemical industries may be divided into two broad classes, according to the way in which you use the electric current—we will divide them into: I: Electrolytic Processes. II: Electro-Thermal Processes.

The difference between these is this—if you send a direct current through a liquid, you can decompose it; the electric current is an extremely active and powerful chemical decomposing agent. If you have the conditions right, and send a current through an anode to a cathode, through an electrolyte, you can split the compound up into its constituents. There is no chemical compound that cannot be split up by the electric current; in fact, the electric current is so powerful that it requires less than ten volts to break up the strongest chemical compound known. Thus an insignificant direct current voltage is practically able to perform the strongest chemical operations and to decompose the strongest chemical compounds.

Therefore, electrolysis puts into the hands of the chemist an extremely strong agent, very frequently a simple agent, by which he can break a compound into its constituents in a way which he cannot do by any ordinary chemical operation. This principle is the basis of a large part of the electro-chemical industries. In such cases the operation requires very little voltage, as I have said, but the output of the operation is proportional to the number of amperes that go through the cell; it is not proportional to the energy employed.

The amperes of current flowing through the electrolyte determine how much of the compound is decomposed and how much of its constituents will be liberated, so that you have an entirely different basis for calculation from what you have with ordinary electrical questions, where the energy of the electric current is the chief factor. The output is proportional to the amperes which flow through, if you get anywhere near 100 per cent ampere efficiency.

Speaking broadly of the second class, the electro-thermal class is made up of those operations in which we use the electric current solely, or principally, for its heating effect; that is, it is used as a heating agent. The advantages which the electric current gives us in that respect are these: first, you have a heating agent which is absolutely under your control; second, you can generate the heat almost exactly where you want it, and utilize it at high efficiency. If you want to heat substances by ordinary means, coal or gas, it is very seldom that you obtain more than 10 to 20 per cent efficiency in heating. The maximum efficiency of heating that I know of in metallurgical operations, using fuel, is in melting pig iron in a foundry cupola; the maximum efficiency of heating there obtained is about 35 per cent. In melting steel in a crucible the efficiency is about 2 per cent. Between those extremes you have the ordinary efficiencies of applying the heat generated by coal and gas. But electrical heat is generated so much under your control, just where you want it, that you *start* with efficiencies of about 35 per cent and run up to efficiencies of nearly 90 per cent of the energy of the current actually usefully utilized, averaging between 50 and 75 per cent. It is because of that very high efficiency of utilization of electrical heat that it is possible to use electricity in these electro-thermal operations, because electrically generated heat, except under very unusual circumstances, costs a great deal more than the same amount of heat generated by means of fuel.

There are only a few places in the world where electrical heat is cheaper than fuel heat, such, for instance, as parts of Norway, where electric current can be purchased at $7.50 per horse-power-year, or $10 a kilowatt-year, and where coal costs from $15 to $20 a ton. Under such conditions you can heat your house by means of electrically generated heat cheaper than you can by coal. Those are exceptional conditions, but ordinarily electrical heat is commercial only by reason of the greater efficiency at which we apply it.

We will now briefly classify the electrolytic industries: what are they and what is their extent?

The original electrolytic industry is electro-plating. In electro-plating operations you have a slab of pure metal which you use as an anode put opposite the object to be plated in an electrolyte which contains the metal which you are to deposit as a plating, and passing the current you plate it with the metal from the solution. This is a large industry, as you know. Think of the extent of the gold and silver plating industries and the nickel plating industry. These industries are nearly one hundred years old. Silver and gold plating was first done with batteries, before the dynamo was invented. Since the invention of the dynamo these industries have extended their operations very greatly.

These industries are very largely distributed throughout the country. The usual small electro-plating plants consume small amounts of power, but there are some large electro-plating plants which use up considerable electric energy.

As far as concerns central station power plants, almost all of these electro-plating plants run on one shift of ten hours a day, and therefore they do not require power continuously. It can be arranged with them to take the power mostly in the "off-peak" hours; when they wish to work overtime it should be done after midnight, in the early morning hours, instead of before midnight.

Besides plating for simply decorative purposes, plating is done for commercial purposes; for instance, electro-galvanizing, that is, the electro-plating of zinc. You are familiar with the electro-zinc plated conduits used in commercial wiring. That is a use of zinc plating to put a covering on these conduits to prevent corrosion. Such plants are, in general, run on a somewhat large scale, and consume more power than those which merely do plating for decorative purposes.

Out of the electrolytic plating industries grew the electro-refining metal industries, which are commercially of much more importance and consume a great deal more power. The electro-platers used a nearly pure metal anode to renew the bath, but if the anode was impure there was a residue of impurities left in the bottom of the bath. The Elkington Brothers in England were plating copper, and they observed that the impurities in the copper, particularly the silver and gold, fell down as mud in the bottom of the bath. Then the thought came to them: Why not use this method of plating metal from anode to cathode as a method of refining it? From this arose the electrolytic metal refining industries. These are all based on the principle of taking as anode the impure metal you want to refine, putting it in a solution of salt that contains the metal, passing direct current through the bath, depositing it as pretty nearly pure metal on the cathode, and leaving the bulk of the impurities as mud or unattacked residue to fall to the bottom of the bath. Some of the impurities will go into solution, such as nickel, zinc and iron, but when using a copper anode the platinum, silver and gold stay in the mud, and are completely recovered, while pure copper only deposits at the cathode. That is the principle which lies at the foundation of the electrolytic refining of copper.

The same principle has been applied to the electrolytic refining of silver, gold, lead, zinc, tin and several other metals, but that of copper is the principal one. Over 90 per cent of all the copper made is put through the electrolytic refineries. There is one refinery near New York, for instance, that refines over five hundred tons of copper in a day when in full operation. This is about $150,000 worth of copper a day, in one refinery. The question of the supply of power to such an industry is very important. The power required in such large plants runs into the thousands of kilowatts, but as far as central station men are concerned, that power is usually considered as constant for twenty-four hours a day, and it has a 100 per cent load factor.

I wish to state, however, that I do not think that the electrochemists—I mean particularly the men running such electrolytic refining industries—have worked out as far as can be done the possibility of running for certain hours a day on reduced power. In many plants where the current is now steadily used for twenty-four hours a day it would be quite possible, in my opinion, to reduce the current materially for a few hours a day, without any damage to the product except reduced output. If you do that, your overhead expenses go on just the same, and it therefore costs money to do it, but you must balance the loss against the gain. It is a question for the central stations to decide whether they can make great reductions if they furnish the current fully during, say, twenty hours a day, and say for four hours a day at two-thirds to one-third the full current, in order to keep the operation running. Metallurgically, I see no reason why it cannot be done, but it is entirely a question of balancing financially the advantages against the disadvantages.

I know of a very large copper refining plant which, before it put up its own power plant, tried to make arrangements with the local city power company to secure the power needed on the basis of reducing the amount of power which it would take at certain hours. The arrangement fell through, because the parties concerned did not thoroughly understand each other, and did not go quite to the bottom of the proposition, analyzing the problem, and getting into their minds exactly the differences which would be caused by the proposed arrangement. I know that the electrochemists were anxious to make the arrangement with the power company, but I think there were faults on both sides; each side did not go to the bottom of the problem in the manner it should have done.

Next in line to these electrolytic refining processes are those which *extract* metal from a compound. There are opportunities of using the electrolytic power of the current in getting the metal from its ores, and these methods are being rapidly extended at the present time. One of them, which you will understand very easily, is, for instance, in the extraction of copper from its ores. Most of the ores of copper are insoluble in water, but you can dissolve them in acid. There is a large mine in Chile, in which the ore is easily soluble in dilute sulphuric acid. The ore is crushed and placed in vats holding about one thousand tons at a time, and leached with sulphuric acid. This brings the copper into solution. Then the solution of sulphate of copper is taken to decomposing tanks, and you have unattackable anodes—a sheet of lead with 4 per cent antimony does very well—and pass a current through. Then the current takes the metal out of the solution, extracts it in a pure state, deposits it on the cathode as pure copper, and leaves in solution sulphuric acid. The solution is then ready to go back to the tanks and take up some more copper, so that the acid is used over and over again. Oxygen gas is liberated at the lead anode, which lasts many months.

That sounds almost too easy to be true, but it is true. The Chile Copper Company is working it on a scale of 10,000 tons of copper ore a day, and it is probably making copper by that method cheaper than any other copper-producing works in the world. This is a much simpler and cheaper operation than any other that could be applied to the handling of that ore.

The same principle, slightly modified, has been applied to the extraction of zinc. Within the last five years large plants have been put up in this country and abroad for the electrolytic extraction of zinc. The chief ore of zinc is zinc sulphide, which is insoluble in water, but if you roast it carefully you can convert part of the zinc sulphide into zinc sulphate which is soluble in water, and leave part as zinc oxide. You take the zinc sulphate solution, pass it through the electrolytic cell, deposit zinc, and leave the sulphuric acid. That sulphuric acid can be used to leach the residue of the ore which contains zinc oxide, and will dissolve out the rest of the zinc. The solution is electrolyzed for its zinc like the first solution. Plants to treat zinc in that way have been put up on a great scale. At Great Falls, Montana, a plant with a capacity of 200 tons of zinc a day has been erected. Several million dollars were put into it, but the price of high-grade zinc went so high during the war that the plant was paying for itself every few months it was in operation. Electrolytic zinc is far purer than the ordinary zinc made in retorts, and is so pure you can use it in making the finest quality of brass for cartridges, whereas most zinc is not fit for making that quality of brass. It runs 99.98 pure and commands a higher price than ordinary retort zinc.

This industry is rapidly extending. I am speaking of industries that have but recently been put in operation. This electrolytic extraction of copper from its ore by the use of electric current, and the electrolytic production of zinc are at the present time rapidly extending, so that you will read more and more about them in the transactions of the societies which interest themselves in electro-chemical processes.

Gold is another example of a metal which can be extracted from its ore in this way. You can take a gold ore, treat it with a potassium cyanide solution, which dissolves out the gold, and then precipitate the gold from the solution by means of electric current. Gold and silver can both be extracted in that way.

Another variety of the electrolytic processes is the conversion of cheap salt into more valuable chemical products. I am not speaking now of extracting metals, but of converting one compound into the other—general chemical processes. I have already mentioned salt. There has grown up a large industry for the manufacture of caustic soda and chlorine. Many works are devoted to this industry, with millions of dollars of capital invested, and they menace very seriously the older chemical plants, which work on the non-electric method and which represent an investment of probably $100,000,000. These plants are springing up in various places, particularly where they have cheap salt, like in Central New York, near Detroit, in West Virginia, and other places.

We take the salt, dissolve it, and pass through a direct current, getting out at the anode chlorine. This chlorine is piped off, and you all know the very many uses of chlorine gas. It has helped very materially in the winning of the war. The uses of chlorine are only beginning to be touched. There will be probably five or ten times as much used in the near future as is being used now, because of the extension of the uses of chlorine in all sorts of industries, the purification of drinking water, sterilization of sewage, disinfection, etc.

At the cathode you obtain a caustic soda which can be converted into carbonate of soda by a simple chemical operation, and so you have the caustic soda industry and the carbonate of soda industry, directly following from the electrolyzing of common salt by the electrolytic method.

I will merely mention some of the other processes of a similar nature which have grown up from the electrolyzing of salt to produce more valuable salts. If you electrolyze common salt solution under different conditions, you can get sodium hypochlorite, a valuable bleach used in the cotton, textile, and paper industries. Electrolyzing it again under a little different condition you convert it into sodium chlorate; all the chlorate used on matches is made in that way. Electrolyzing it under still different conditions, you get sodium per-chlorate, which is extremely valuable for its antiseptic and oxidyzing qualities. Other salts, such as permanganates, per-borates, per-carbonates, per-sulphates, are made by similar processes. These are all methods of converting a cheap solution of a cheap salt into a much more valuable product, which has a great variety of uses.

The iodoform which is at the present time used so much in medicine is, I believe, made electro-chemically, from a solution of potassium iodide and iodine in the presence of alcohol.

Another application of the electrolytic method, used somewhat differently, is the production of gases. You can electrolyze water which contains some sulphuric acid or a little caustic soda and produce hydrogen and oxygen. Many plants have been erected in different parts of the country to get hydrogen and oxygen for blow-pipe work, and in general for various chemical operations. Ozone can be made in the same way by a little variation of the process. Chlorine is made as a by-product of the caustic soda industry, and is made in extremely large amounts. The sterilization of water and sewage can be achieved by electrolyzing them in the presence of a small amount of sodium chloride, and when the chlorine is generated it entirely sterilizes them. These methods are being extended rapidly.

There are other electrolytic operations where you pass a current through a fused salt, usually around redness. If you melt and electrolyze sodium chloride under correct conditions, you get chlorine at one pole and sodium at the other—metallic sodium. Metallic sodium, which is high priced, is obtained directly, with chlorine as a by-product. On the other hand, aluminium, which is now made in such tremendous quantities, is made by electrolyzing a huge bath in which alumina is dissolved—the oxide of aluminium. It is dissolved in a salt called cryolite, which melts at a bright red heat. You pass the current through the melt and get oxygen at the anodes (burning them to carbon monoxide) and aluminium at the cathode.

That is the way in which all aluminium is made. This process has reduced the cost of making aluminium from about $2.50 a pound to less than 15 cents a pound.

The size of the aluminium industry is indicated by the fact that there are probably four hundred thousand horsepower at work in the United States making aluminium at the present time, and the chief company which is making it is developing a water power of 400,000 horsepower more, in eastern Tennessee, in order to double its output.

These processes I have just spoken of are essentially continuous, twenty-four-hour processes. When you have to employ a current to melt the electrolyte, and to keep it melted by its own resistance, you cannot let up on the current more than a few minutes at a time, because any stoppage of current would allow the bath to freeze solid.

Sodium, calcium, magnesium and cerium are all produced by methods resembling that used for aluminium.

I have exhausted what I have to say about the electrolytic methods, and will now turn to the electro-thermal methods, giving a description of them as briefly as possible. I am now referring to the methods where the current is used solely for its heating effect. Many people who have not studied the question closely think that an electrical apparatus that is used for its heating effect must necessarily be run at a very high temperature. While it is true that you can get a higher temperature with an electric furnace than in any other way, you can also run an electric furnace at a low temperature or moderate temperature, and the range at which they are run has been cut down until we use them to melt ordinary metals, tin, zinc, brass, etc., as well as for melting steel, and also for temperatures which approximate the volatilizing point of carbon.

Let me say of the electro-thermal methods, in general, that in them you use the electric current for its heating effect, and when you are informed that the useful effect thus obtained is proportional to the amount of electrical *energy,* and not proportional to the amperes used, you see on what an entirely different basis from the electrolytic methods we are working. The product of volts by amperes represents the amount of electrical energy which has been absorbed, and you figure it out on that basis. High amperes and low volts, or high volts and low amperes—it does not make any difference as long as you get electrical energy into the furnace. In electric furnaces you can use alternating current or direct current, generally the former because it is cheaper and cannot have one-sided effects, but in electrolytic operations you must use direct current only.

We have two fundamental types of electric furnaces, the arc and the resistance. In an arc furnace the current jumps through a gap in the air in the furnace. There is a break in the circuit and therefore you have an arc. Speaking of the history of this process, experiments began a hundred years ago, using the battery and small carbon pencils. Now the electric pencils have grown to electrodes 24 inches in diameter and 7 feet long, and it is also interesting to note the growth which has taken place in the size of electric furnaces, and the scale on which they are operating. They have grown from little bits of experimental things in the laboratory to furnaces of fifteen thousand kilowatts as a maximum.

How can we use the electric arc for chemical operations? We can, as one simple method, bring the substance right into the arc and heat it nearly to the temperature of the arc. For example, pass air through it rapidly, and as it goes through and comes out again it is rapidly heated and cooled; part of the oxygen and nitrogen combine with each other, and there you have the basis of the process for the fixation of atmospheric nitrogen.

The commercial importance of this industry may be realized from the following instance: I have visited a mountain valley in Norway where ten years ago there were a few farms, with a big waterfall, some two thousand feet high, at the upper end of the valley. Two years later a town was there with ten thousand inhabitants, two power stations of 175,000 horsepower each and a large manufacturing plant, looking like an industrial town of Eastern France. That was in Central Norway, and the nitrate fertilizer there made was being shipped as far as the sugar plantations of Hawaii. That plant for the fixation of nitrogen of the air and production of nitric acid was built largely by German capital, because the Germans realized the importance of having an artificial method of making nitric acid. The method of making nitric acid developed there enabled Germany to keep in the war for four years, whereas otherwise she would not have been in the war over four months; it was their salvation when their supplies of nitrates from Chile were cut off. The war quickly exhausted their stock of nitrates, and they would have had to throw up their hands inside of six months if it had not been that they quickly put up in Germany numerous plants for the fixation of nitrogen and the production of nitric acid. At every place where a little power could be spared they put in a nitric acid plant, and it is estimated that they put in nearly five hundred thousand horsepower of these plants, and spent $100,000,000 inside of six months in putting up these plants, thus saving the nitric acid situation.

The arc furnaces used are built to a capacity of 2,000 kilowatts. The arc is spread out by means of magnets, so that it is a flat disc six feet in diameter, and they call it the "Electric Sun." The air is simply passed through the arc.

Another use of the arc furnace is by plain radiation from the arc to melt substances brought near to it; in other words, taking two electrodes, with a heavy arc between, bring the metals close to them, and melt them by heat radiated by the arc. The arc also radiates heat against the roof, and this is partly reflected back to the metal. These arc radiation furnaces, however, have been built up to 1,000 kilowatts, and metals can be melted in them by the ton. Steel furnaces up to six tons' capacity have been operated on this principle.

There is another kind of arc furnace, where the charge itself forms one pole of the arc. They are a little bit more complex in action. You may have, for instance, electrodes passing downward into a steel furnace, the bath of steel itself forming one other pole of the arc. The material is heated partly by resistance, but principally by the arc at its surface. There are hundreds of furnaces of that type in operation. We have several kinds in this country, but the principal one is the Heroult, in which three electrodes pass through the roof of the furnace and the current runs from one electrode to the bath underneath and then to the other electrode, using 3-phase current. The surface of the bath is kept hot principally by the arcs playing on it. Furnaces working on that principle are in operation up to a capacity of thirty tons. I was talking to a gentleman recently who was operating some of these furnaces, and he agreed that there is no reason why one should not build fifty-ton furnaces if it was desirable. Such a furnace would take 3,000 kilowatts.

The most important thing in the metallurgical field at the present time is the development of these electrical steel furnaces. It will not be long before all the steel made will be put through an electric furnace before it is finished. You can make in them steel which approximates or equals in quality crucible steel, but in the other processes, the Bessemer and open-hearth, you cannot duplicate the electric furnace product.

The U. S. Steel Corporation will be turning out 20,000 tons of electric steel a month in the near future, using the electric furnace to finish steel made first in the Bessemer converter, nearly finished in the open-hearth furnace, and given its finishing touches in the electric furnace.

In finishing steel in the electric furnace you can get it perfectly unoxidized, since air does not have an opportunity to get in; it is not needed. Whereas in a furnace heated by gas you must have gases passing through to heat it, and they spoil the quality of the steel. The electric furnace can be closed air tight, producing a steel comparable in quality to crucible steel, or anywhere in between the quality of open-hearth and crucible steel. The electric steel industry will increase very rapidly; it has increased in the United States in the last five years from about thirty furnaces making electric steel to two hundred and fifty or more. The steelmakers have been simply "falling over themselves" to put in electric furnaces.

Time is lacking to describe the resistance class of furnaces, wherein, like an incandescent filament, a large resistor converts the electric energy into heat. This resistor may be the substance itself being treated, or a solid resistor like a carbon rod, or a mass of granular carbon, the substance being heated by contact with or radiation from the resistor. This class includes the induction furnaces where the resistor is heated by a secondary induced current, such a furnace being really a transformer with a secondary of one turn. It includes the electric pig-iron furnace, which is commercially profitable in Norway and Sweden, also the various electric-heating furnaces of the Baily type, which are at present making a great stir in the steel industry.

I had a few pictures to show you to prove the reality of some of the things I have been talking about, but I have already consumed very nearly my allotted time, and can, therefore, mention only briefly a few other operations or processes which are of much commercial importance and which consume large amounts of power. For instance, we have the carborundum furnaces at

Niagara Falls. Carborundum cannot be made in any other way than by the electric furnace. There are the ferro-alloy furnaces which produce the ferro-alloys, a wonderful series of molybdenum, chromium, vanadium and silicon alloys which are used in making the valuable alloy steels, of which you know the uses. That industry is growing rapidly and consumes large amounts of power. The calcium carbide industry alone uses nearly a million horsepower, but must be dismissed with mere mention.

We have also electrical heating furnaces not meant to melt metals but simply to heat them—a large variety of interesting furnaces. It will be but a short time before all the brass in this country will be melted by electric furnaces. It will not be long before most of the heat treatment of steel, that which is preliminary to hardening, tempering and annealing, will be done electrically.

You will notice that there are essentially two kinds of operations which I have spoken of: some are continuous and some are intermittent, and of the continuous processes, some are actually 100 per cent load factor. The discontinuous processes can be operated for a short time and then discontinued. There is a little steel furnace near my home that operates from twelve o'clock at night until four o'clock in the afternoon, and during peak hours it practically shuts off its current. Many of the continuous processes could, I am sure, operate on reduced current in "peak" hours, if it were made sufficiently attractive to them to do so by a special low-power rate.

I am forced to admit that the electro-chemist and the electrometallurgist have not studied their power problems as they should have done. They have not gotten together with the central station men on a broad basis of enlightened discussion. Perhaps there is blame on both sides. The electro-chemists have not studied out their questions thoroughly on the possibility of using intermittent power, like running a batch of steel, and still less thoroughly on some of the continuous operations where the power might be reduced for a few hours and brought up again. I think those are particularly the directions where electro-chemists have not fully realized the possibility of using central station power.

In conclusion, I believe the best hope central power stations have of raising their power factor and smoothing over the peaks and valleys of their load curve, lies in close cooperation with the electro-chemical and electro-metallurgical industries.

E. W. LLOYD, Chicago: It is peculiarly fortunate that we were able to listen to Prof. Richards this morning on a subject to which, to my mind, this Association has given altogether too little attention. The Electro-Chemical Society has assumed a very important position in relation to the electrical and electro-chemical industries of this country, and we have not associated ourselves with it to the extent we should have.

The tremendous amount of energy used by electro-metallurgical and electrolytic processes must have been a revelation to many people who listened to Prof. Richards. Some of us have given attention to the wonderful possibilities for the central station business in this field, and I am sure it will be very profitable for the members of this Association to pay more attention to this subject than they have up to this time. It may be that some of our members have felt that the concerns using these processes in their neighborhood are too small to make profitable the business of supplying power to them, but there are very many important factories of this class which are of sufficient importance to investigate and, if necessary, to spend considerable time and money to place on central station lines.

I cannot refrain from speaking quite earnestly about this subject, because it has been brought so closely to my attention, particularly in the last two years on account of what has transpired during the war. The manufacturers of these products need electric power, and the central station companies can bring about an arrangement with them which will yield a handsome revenue at profitable rates. I am convinced that there are a large number of products that can be manufactured by electricity at existing standard rates. There are certain electro-chemical products marketable at quite a high price per pound or ton, in the manufacture of which the cost of electricity is not, in my judgment, the most important factor. For instance, the melting of high-grade steels and alloys is accomplished by using so few kilowatt-hours per ton that the cost of electricity, as was brought out in the discussion in one of our Commercial Sessions yesterday, is not important.

Therefore, we should take the opportunity presented and brought to a focus by the war to get in closer touch with the American Electro-Chemical Society and bring about relations which will be profitable to both of us. As Prof. Richards has said, there have been misunderstandings, perhaps due to the lack of knowledge on the part of both the manufacturer of the electro-chemical or electro-thermo processes and the central station man, and the latter has neglected many opportunities for presenting the matter from the central station point of view to these manufacturers, which I hope he will now begin to do.

I think Prof. Richards presented a matter of epochal importance to this Association, and I move a vote of thanks to the Professor for bringing the matter to the attention of our membership by giving us the valuable information which he has on these important subjects.

(The motion was duly put to vote and carried.)

THE PRESIDENT: We will now call for the Report of the Committee on Memorials, Mr. T. E. Bibbins, chairman.

REPORT OF COMMITTEE ON MEMORIALS

The Committee on Memorials brings to your attention, with extreme regret, the passing of Mr. Paul Lüpke, whose rare personality will be keenly missed in National Electric Light Association circles.

In recognition of Mr. Lüpke's distinguished service, the Executive Committee appointed from its membership a special subcommittee composed of Messrs. Walter Neumuller, chairman, J. E. Davidson and S. A. Sewall to draft a fitting memorial to his memory.

I will now read the excellent memorial prepared by this Committee, following which the report of the Committee on Memorials appointed by this Convention will be presented.

"The absence of a message from Paul Lüpke at this Convention will be keenly felt by those of us who have in previous years listened to and been helped by their optimism and inspiration. Providence has seen fit to call him to his higher reward, but although he has gone from among us, the message he has given us from time to time will live on.

"In an industry that is still young it is quite appropriate that the messages from Paul Lüpke should have been addressed especially to the young men of the business. Their all-embracing scope, however, and their very sound philosophy make them equally pertinent to the older men as well.

"Few of us will forget Mr. Lüpke's 'Anticipation,' and particularly that line in which he says, 'To youth the years are long, but they gather speed like a falling stone.'

"Your Committee feels that messages of such inspiration and help as these should not remain hidden away in the archives of the Association, but should be gathered into a volume which shall serve not only as a memorial to our late fellow-member, but as an aid to those who are still to enter this industry.

"Mr. Lüpke died on February 9, 1919, in his fifty-eighth year, after a career in the central station industry in this country covering a period of thirty-two years. While he is best known to the majority of us for his writings, his work as an electrical engineer in the service of the Public Service Electric Company establishes him on an equal plane as a doer of practical things.

"Your Committee recommends, therefore, as an expression of the profound loss which the National Electric Light Association feels in the passing away of Paul Lüpke, that his writings be reprinted in book form to serve as a memorial, and that a copy suitably bound and engrossed be sent as a token of our respect and sympathy to his family."

J. E. DAVIDSON,
S. A. SEWALL,
WALTER NEUMULLER, Chairman.

The Committee on Memorials appointed by this Convention desires to do honor to the memory of several gentlemen who have departed this life since the last meeting of our Association. All of these individuals had risen to positions of prominence in their respective callings, many of them being associated with our member companies and kindred interests.

CHARLES ALLIS, first president of the reorganized Allis-Chalmers Manufacturing Company, Milwaukee, Wis., died of pneumonia on July 22, 1918, aged 65 years. At the time of his death he was president of the Chicago Belting Company, a trustee and member of the executive committee of the Northwestern Mutual Life Insurance Company and was also identified with many large manufacturing concerns.

WILLIAM ALLIS, chairman of the Board of Directors of the Allis-Chalmers Company, Milwaukee, Wis., died on October 10, 1918, at the age of 69 years. Mr. Allis succeeded his father, the late E. P. Allis, as president of E. P. Allis Company and continued in that position until the consolidation, which resulted in the Allis-Chalmers Company, of which he became chairman of the Board.

HORACE E. ANDREWS, president of the Rochester Railway & Light Company, Rochester, N. Y., died of pneumonia at his home in New York City on December 1, 1918, at the age of 55 years. He was also president of the New York State Railways, the Mohawk Valley Railway and the Schenectady Railway. Mr.

Andrews spent his entire business career in the electric traction industry, in the upbuilding of which he played a prominent part.

Charles O. Bancroft, former president of the Cumberland Light & Power Company, Portland, Me., died in Portland in the fall of 1918 at the age of 76 years. At one time he was president of the Portland Electric Light Company, the predecessor of the Cumberland Company, and was also president of the Marine Savings Bank of Portland for nine years.

Harry L. Bleecker, vice-president and general manager of The Washington Water Power Company, of Spokane, Wash., died in New York City while on a visit on December 11, 1918, of pneumonia following a severe cold and a slight attack of influenza. Mr. Bleecker was 45 years old and, since going to Spokane sixteen years ago, had been continuously associated with power development in the great Inland Empire of the Northwest.

John Bottomley, aged 71 years, vice-president, treasurer, secretary and a director of the Marconi Wireless Telegraph Company of America, New York, died June 16, 1918, after a brief illness.

Mr. Bottomley was born in Belfast, Ireland, where his father was a linen merchant. The famous scientist, the late Lord Kelvin, was his uncle. He practiced law until 1898, when Mr. Marconi interested him in wireless telegraphy and he undertook the task of introducing the new science to the American world of commerce, successfully guiding the company through its infancy, beset by patent litigation and by competition not always based on fair dealing or financial soundness. He lived to see the company reach a solid financial basis and take a leading part in the radio world.

Emil C. Braun, electrical engineer, who came to the United States in charge of the German electrical exhibit at the Chicago World's Fair in 1893, died suddenly in Chicago on March 22, 1919, at the age of 51 years. Mr. Braun had been connected with H. M. Byllesby & Company since the organization of the company in 1902. He was a graduate electrical engineer of the University of Berlin.

Willard E. Case, widely known as a student of electrical science, particularly electrochemistry, died at Auburn, N. Y., on October 27, 1918, from Spanish influenza. Mr. Case was born in Auburn on February 19, 1857, and on his mother's side was descended from John Fitch, a pioneer in steam navigation. Mr. Case read a paper before the Royal Society of London on "A New Means of Converting Heat Energy Into Electrical Energy," which brought him into prominence. In 1897 he read a valuable paper before the New York Electrical Society on "Electricity from Carbon without Heat." During the war his laboratories at Auburn, among the finest in the country, were used by a force of electrochemists engaged in government work.

Winfield Scott Chaplin, a noted teacher of technology, died in the spring of 1918 at the age of nearly 70 years. He was a graduate of West Point, but served in the army only a short time. Professor Chaplin won wide recognition for his educational work, and among the distinctions which he received was the degree of Doctor of Laws, conferred on him by Harvard University, that of Doctor of Technology by the University of Japan, and the Order of the Rising Sun by the Emperor of Japan. He had a wide affiliation with technical societies.

George E. Claflin, a vice-president of the Electric Bond and Share Company, died suddenly on April 18, 1919, at Atlantic City, at the age of 53 years. Mr. Claflin entered the service of the Westinghouse Electric and Manufacturing Company in 1888, and was connected with some of the earliest electric generating stations in the country. In 1913 he was elected a vice-president of the Electric Bond and Share Company.

John J. Cummings, former president of the Syracuse Lighting Company, Syracuse, N. Y., died March 17, 1919, from pneumonia following poor health for several years. He entered business as an office boy in the wholesale dry goods house of Neal & Hyde, advancing rapidly until he became financial manager for the concern. After twenty-five years of service he left the company to become president of the Syracuse Lighting Company. In 1909 he resigned and became interested in a contracting firm.

Samuel A. Freshney, district manager for Grand Rapids, Mich., of the Consumers' Power Company, died at his home on September 16, 1918, after an illness of only a few hours, at the age of 51 years. In the fall of 1912 he became general manager of the Grand Rapids-Muskegon Power Company, and on the merger with the Consumers' Power Company he retained the managership of the Grand Rapids district. Mr. Freshney took considerable interest in National Electric Light Association activities and in 1915 was elected president of the Michigan Section, N.E.L.A.

PROF. ICHISUKE FUJIOKA, president of the Tokyo (Japan) Electric Company and director of several other firms, died of apoplexy on March 5, 1918. He was particularly well known in electric circles in the United States and was an honorary member of the National Electric Light Association and an associate member of the American Institute of Electrical Engineers. He was also a fellow of the Royal Scottish Academy and a member of the British Institution of Electrical Engineers.

F. M. GRANT, president of the F. M. Grant Electric Company, electrical contractors and engineers, died recently at his home in Cleveland, Ohio, at the age of 50 years, after a short illness. He formerly was associated with the Erner Electric Company of Columbus and entered business in Cleveland five years ago.

PROF. F. R. HUTTON, past-president of the American Society of Mechanical Engineers, died on May 14, 1918, at the age of 65 years. Professor Hutton was graduated from the School of Mines, Columbia University, in 1876. Columbia conferred upon Professor Hutton in 1882 the degree of Ph.D. and in 1904 the degree of Sc.D. He became secretary of the American Society of Mechanical Engineers in 1883, three years after its organization.

GEORGE J. JACKSON, president of the National Conduit & Cable Company, died on April 8, 1918, of heart trouble, at his home in New York City, in his 57th year. Mr. Jackson had been prominently identified with the cable industry for many years, having been prior to that engaged in the wholesale dry-goods business as an importer. His first connection with the wire field was with the Norwich Wire Company, a small concern which he had purchased. About twenty years ago this company was bought out by the National Conduit & Cable Company and Mr. Jackson was retained as secretary. He continued in this capacity until he was elected president on the retirement of E. S. Perot.

A. D. JUILLIARD, one of the pioneers in electric lighting in New York City, died of pneumonia on April 25, 1919, at the age of 70. He was of French extraction, born at Canton, Ohio, and a father of the dry-goods commission business in New York, in which he was a leading figure up to the time of his death. He was actively connected with the introduction and development of the Brush and Swan electric lighting systems in New York City in the early eighties, having among his associates George W. Stockley and W. L. Strong, afterward mayor of the city. He was vice-president and director of both the old Brush Electric Illuminating Company of New York and the Brush-Swan Electric Light Company of New England. Although immersed in insurance and railway affairs and in Republican politics, he gave a great deal of time and attention to these companies and other electrical interests, which later became merged into the great public utility, the New York Edison Company, now serving Manhattan Island as a whole. To Mr. Juilliard, a man of most engaging personality, high public spirit and a culture manifested in his long and generous support of opera in New York, the electrical industry owes not a little for his far-sighted financial support at a time when it was but a weak and struggling enterprise.

Mechanical engineering circles were shocked by the news that WILLIAM KENT had died at Gananoque, Ont., on September 18, 1918. Mr. Kent was born in Philadelphia on March 5, 1851. From 1895 to 1903 he was associate editor of *Engineering News* and then for five years was dean of the L. C. Smith College of Applied Science of Syracuse (N. Y.) University. Since that time he had practiced as a general consulting engineer. He contributed numerous valuable papers and discussions to the engineering societies in which he held membership and to technical journals, and wrote many technical books, among which is Kent's "Mechanical Engineers' Pocket Book," reaching its ninth edition in 1915. He had taken out more than twenty patents on weighing machines, boilers, smokeless furnaces, etc.

M. L. McKinley, one of the pioneers in the installation and construction of electrical distribution systems on the Pacific Coast, died on February 19, 1919. He entered the employ of the old Thomson-Houston Company in 1889 and, after some experience in the construction of the St. Louis street railway system and street lighting system and later at the Chicago World's Fair, he went to the Pacific Coast in 1894. There he formed a partnership with Messrs. Dunn and Peterson to engage in electrical contracting. They installed the first underground system in San Francisco for the Pacific Power Company in addition to a number of other important lines. Mr. McKinley was general manager for the Tuolumne County Electric Light & Power Company for ten years, until its purchase by the Sierra & San Francisco Power Company, of San Francisco. Since that time he had been continuously associated with Capt. H. F. Jackson, president and general manager of that property, in its management and operation.

Charles G. Roebling, president of John A. Roebling Sons, wire manufacturers, died at his home in Trenton, N. J., October 5, 1918, aged 69 years. He was graduated from Rensselaer Polytechnic Institute, Troy, N. Y., with degree of civil engineer in 1871. For many years he was mechanical engineer of the wire works and better known, perhaps, in connection with the construction of Brooklyn Bridge, which he with his brother, Washington A. Roebling, completed after the death of their father, John A. Roebling.

Major James Alfred Roosevelt, member of the consulting engineering firm of Roosevelt & Thompson, New York City, and a cousin of the late Theodore Roosevelt, died in March, 1919, on the naval transport *Great Northern* while the steamship was 400 miles east of Sandy Hook. Major Roosevelt was well known for his ability to manage utilities, particularly electric railway companies. In 1911 he directed the operation of the British Columbia Company, which operates electric light and railway systems in British Columbia. He went overseas with the 77th Division and was cited at Vesle River for displaying exceptional bravery and courage under heavy fire.

CAPT. STUART THOMSON, consulting engineer for the General Electric Company and son of Dr. Elihu Thomson, died from pneumonia on March 23, 1919. Captain Thomson was a graduate of Harvard University and of the Massachusetts Institute of Technology. He had but recently returned to Schenectady from Washington, where he had been for a year and a half in charge of engineering and production of aircraft armament, Ordnance Department.

EDWARD ALLEN WICKES, formerly president of the Niagara Falls (N. Y.) Power Company, died suddenly at his home in New York City on December 6, 1918, at 75 years of age. He resigned as president of the Niagara Falls Power Company in the summer of 1917 on account of advancing age. He had been president many years and had been active in the affairs of the company since its inception in 1890. Mr. Wickes was a graduate of Williams College and a brevet-major of volunteers in the Civil War.

Respectfully submitted,
S. A. SEWALL,
T. E. BIBBINS, Chairman.

Atlantic City, N. J., May 22, 1919.

(On motion the report was duly adopted.)

THE PRESIDENT: I have asked Mr. W. J. Meyers, Chairman of the Committee on Form of Annual Report to Commissions, which is printed, to present that report by title only.

REPORT OF COMMITTEE ON FORM OF ANNUAL REPORTS TO COMMISSIONS

This year's work of your Committee on Form of Annual Reports to Commissions began with a letter sent under date of August 21, 1918, to the Chairman of the Committee on Statistics and Accounts of Public Utility Companies of the National Association of Railway and Utility Commissioners, calling his attention to the serious straits in which the electrical corporations found themselves because of burdensome increases in expenses and the difficulty of obtaining competent and sufficiently trained employees for work in accounting. The letter also requested a conference with his committee at which we might discuss the requirements of the various Commissions' forms of annual reports with a view to the elimination of those which had not produced information of sufficient public importance to warrant their retention.

A copy of the letter follows:

August 21st 1918.

HON. EDWIN J. BEAN, Chairman,
Committee on Statistics and Accounts of Public
Utility Companies, National Association of
Railway and Utility Commissioners,
Jefferson City, Mo.

DEAR SIR:

Public utility companies are at the present time finding it very difficult to maintain their organizations in efficient operating condition. Many of them find their revenues inadequate to cover their unavoidable expenses, and even those companies that are still able to earn their fixed charges find it difficult to retain a force of skilled and capable employees. The requirements of the Government through the draft and through the various civil departments connected more or less closely with war work, and the competition of war industries and of various other businesses able to collect for their services and products "what the traffic will reasonably bear," take away from us many of our more capable and better trained employees, and we find it difficult, and in many cases impossible, to replace such employees at the rates of wages which our revenues permit us to pay.

Despite the fact that in many lines of industry wages are extremely high, there are many others in which they have not risen in proportion to the apparently unavoidable increase in living expenses, so that such attempts as have been made by public utilities to increase their net revenues through advances in rates have frequently been vigorously contested by consumers, and it appears to be necessary, therefore, to curtail expenses whenever practicable.

For a considerable number of years it has been generally felt by the executives of public utility companies that a large portion of the material called for in the annual reports required to be made by such companies to the Commissions is unnecessary from any standpoint with which the companies are acquainted. The material complained of is useless to the companies compiling it, and they are not able to find that it is useful either to the Commissions or to the consumers served by the companies. The companies observe that when cases arise affecting them specifically or individually, they very rarely, if ever, escape the requirement of extended special compilations, and that the mass of statistical material which they have already submitted in connection with their annual reports to the Commissions finds little or no application.

I take it that we may justly assume that the Public Service Commissions acting as trustees for the public interest will not require us to make any extended argument against a policy which results in useless expense or in expense which, if not entirely useless, produces no commensurate benefit; and that under the burdens which now oppress us, and in some instances threaten to overwhelm us, they will not take it amiss if we beg of them that they will make a critical and unbiased review of their annual report requirements, particularly of those in the statistical portion of the reports, with the purpose of eliminating therefrom during the period of the war and for a couple of years thereafter until the period of reorganization is substantially completed, every requirement which can not be clearly and positively shown to be productive not only of interesting information but of essential information, information clearly of public importance and directly useful in facilitating the regulatory supervision of the public utility companies. Under the stress of war, we are constantly and properly being urged to eliminate all useless and unnecessary expense, and to draw a clear and sharp line of demarcation between essential and non-essential industries. Much of the statistical matter now called for in the forms for annual reports to Commissions seems to be only generally informative and not at all essential to the proper discharge of the regulatory or supervisory functions of the Commissions.

We make these suggestions in the interest of economy and efficiency and in the interest of conservation of man power. We are facing a most serious shortage in our clerical forces, which are much depleted by voluntary enlistments and by the requirements of the draft, also by competition of war industries, and although we are using women clerks wherever practicable, we find it impossible to secure sufficient clerical labor to do the essential work of accounting and statistics necessary for the administrations of the companies.

The National Electric Light Association's Committee on the Form of Annual Reports to Commissions has for several years had this matter under consideration, and it presented at the annual convention of that Association held in Chicago in May, 1916, an extended and valuable report on the subject. The report is shown beginning on page 21 of the volume of the Association's *Proceedings* for that year devoted to the sessions of the Accounting Section, and the discussion of the report is shown beginning on page 176 of the same volume. I presume that you will find that volume in the files of your Commission; if you do not find it there, please let me know and I will try to procure a copy for you.

You will recollect that about a year ago upon request of the railway companies and with the approval of the National Association of Railway and Utility Commissioners, the Interstate Commerce Commission very materially reduced its annual report requirements, withdrawing many schedules completely and largely reducing many others. We hope that your Association will take similar action this year with respect to the annual report requirements imposed on electrical corporations by the Utility Commissions of the various States, and we should very much appreciate the privilege of a conference with your committee at an early date, at such place as may be most convenient for you, at which these matters may receive thorough discussion and careful consideration.

Very respectfully,
(Signed) W. J. MEYERS, *Chairman,*
Committee on Form of Annual
Reports to Commissions.

We were unable to secure any response to the letter, and the lack of action on the part of the Committee was called to the attention of the acting president of that Association, who was later elected its president. He promised that for the current year he would appoint a committee which would give the matter careful consideration.

When it became apparent that we would not receive from that committee consideration in time to enable us to secure any aid from the National Association of Railway and Utility Commissioners, we determined to act through the Executive Committee of the Accounting Section, and on October 4, 1918, the Executive Committee adopted the following series of resolutions on the subject and ordered that copies be sent to each Public Service Commission having authority to require annual or other reports from electrical corporations:

> The Executive Committee of the Accounting Section of the National Electric Light Association is deeply concerned over the conditions prevailing generally in the offices of the member companies in regard to shortage of man power, and more particularly at the extent to which employees long in the service of the respective companies, experienced and in many instances specially educated by the companies to discharge their important duties, have, because of the war, sought or been compelled to take up other lines of work. These experienced, capable, reliable men have been replaced

by inexperienced youths and old men, but principally by women, many of whom have had no previous business experience whatever. As a result of this situation, the office work has been delayed, errors are frequent, and the time of the higher accounting officials has been almost entirely employed in engaging and breaking in new help, and the work of the office has been confined to only essential records which must be kept as long as the business is operated. Thus statistics in regard to physical property, details of current production, interesting but not immediately essential cost data, are no longer prepared and will not be while the war lasts. In seeking ways by which the time of the present depleted and inexperienced forces may be devoted to strictly essential matters only, the attention of the Committee has been called to the form of annual reports called for by the Public Service Commissions of the various States. The reports are voluminous and exhaustive compilations of minute facts of historical, financial, physical and statistical data, repeated year after year with but slight variation. The reports in these respects contain but little data which the companies for their own information and action would feel justified in preparing, the companies relying in necessary instances upon data accumulated in previous years. The times require the conservation of man power, the elimination of all records and data not necessary to the immediate operation of the enterprise, and the utmost economy in the use of paper and all office paraphernalia.

In view of the conditions here described, the necessary elimination of non-essential records and the need of the strictest economy in operation, the Committee is of the opinion that the Public Service Commissions of the various States should cooperate with the companies in their respective jurisdictions and that one way in which this cooperation may become most effective will be in cutting down the size of the annual report and confining its scope to cover only the financial transactions, including the Income Statement and Balance Sheet with suitable explanations of the variations disclosed by the report, and in addition a terse statement of Important Changes occurring during the year. In furtherance of these views the Executive Committee of the Accounting Section of the National Electric Light Association, at its meeting held in New York, on October 4th, unanimously adopted the following resolution:

> WHEREAS, the needs of the United States in the prosecution of the war have made very serious drafts on the experienced forces of employees in the accounting and other departments of electric light companies and compelled their replacement by inexperienced and sometimes incapable employees, and
>
> WHEREAS, the heavily increased expenses to which these companies are and have been for the last two years subjected through extremely high costs of material, high wages, and high taxes, make it necessary that every avoidable expense be eliminated,
>
> BE IT RESOLVED, that the Chairman of the Committee on Form of Annual Reports to Commissions be directed to communicate with the chairmen of the various Public Service Commissions throughout the United States and to request that such Commissions reduce for the period of the war and at least one year thereafter their requirements with respect to annual reports so that they shall call for only a balance sheet, an income account, and a brief statement of important changes during the year, with such explanatory statements as may be necessary to make the statement of important changes intelligible.
>
> BE IT FURTHER RESOLVED, that the said Chairman request all State and Geographic Sections of the Association to cooperate in securing relief from what are under present conditions the extremely burdensome requirements of the forms heretofore used by Public Service Commissions in receiving annual reports from electric light companies.
>
> FURTHER RESOLVED, that copies of this preliminary statement and these resolutions be forwarded by the Secretary of the Association to all Federal and State Boards interested and whose cooperation may be helpful in bringing about the result which this Committee

feels is so vitally necessary in this stage of the country's affairs.

More or less sympathetic responses were received from most of the Commissions, and substantial relief was given by a few. It is apparent, however, that the Commissions do not yet properly appreciate the unnecessary and inexcusable burdens placed on the electrical corporations by many of the requirements of their annual report forms.

Some of the needed relief may doubtless be obtained through the aid of the committee of the National Association of Commissioners, when a committee is appointed by that organization which will give the matter attention, but it must be borne in mind by the companies that the National Association of Commissioners is without authority to bring about any improvement in the situation. The authority to afford relief is in the individual Commissions, and while many of those Commissions listen respectfully to the recommendations of the National Electric Light Association, each of them is thoroughly aware of the fact that a very large proportion of the N.E.L.A. is wholly outside the State in which the Commission finds its support and the source of its authority, and that while the views of the National Association and its committees may in the abstract be worthy of intellectual respect, they do not find reflection in the ballot box, save as they are actively supported by citizens of the particular State. Improvement in this matter must come mainly from the action of individual companies and of State associations. These may and should keep step with the N.E.L.A., but they must act directly on the Commissions of the several States and not through the National Association.

The companies of each State should establish a committee of a few of their most able and tactful members to lay the situation, after securing the informal consent of the Commission, before its statistical and accounting sections, and, having produced in those sections an appreciation and understanding of the practical working of the requirements of the annual report form, and having secured from them a clear idea of the needs for statistical information developed through the experience of the Commission in the administration of the statute creating it, the committee should, in cooperation with the Commission's representatives, formulate a series of requirements which will yield the information which the Commission actually needs, and do so with the least possible burden to the companies. When this has been done, and the good will of the Commission's representatives obtained, the matter may be laid before the Commission with a fair prospect that it will receive a satisfactory disposition. Until the cooperation of the statistical and accounting divisions of the Commission is secured, there is small prospect of relief from its requirements, except where one of the members of the Commission is skilled in statistics and accounts and takes a personal interest in such matters, in which case it will be found advisable to enlist his aid at the earliest practicable moment.

Too much emphasis cannot be laid on the necessity for an understanding of the Commission's point of view by such a committee. Many of the burdensome requirements of the annual report forms were adopted in the early stages of commission regulation when the whole situation was overlaid with suspicion and prejudice, and they have been carried forward through inertia and copied from the forms of the older Commissions into those of the newer Commissions. With more than ten years' experience, the Commissions ought now to be able to show which of the requirements have definitely proved to be useful, and all others should be stricken out. The companies should give the Commissions the benefit of practical experience and show how to compile and furnish really useful information at the least practicable cost.

Respectfully submitted,

W J MEYERS, *Chairman*
H R FROST
C H HODSKINSON
W E HOUGHTON
W A JONES
H R KERN
G M MOORE
R H SMITH

THE PRESIDENT: We will now have the Report of the Committee on Doherty and Billings Prizes, to be presented by Mr. A. S. Loizeaux, Chairman of the Committee.

REPORT OF COMMITTEE ON DOHERTY AND BILLINGS PRIZES

Ten papers read before Company Sections have been submitted in competition for the Doherty and Billings prizes. Last year fifteen papers were submitted, and the year before twenty papers entered the competition.

Not only are the papers this year fewer in number than heretofore, but in general they do not have as high a standard as in previous years. These facts are a natural effect of the war period from which we have just emerged. Many of our members entered the Government service, and those who remained were overloaded in the effort to supply the electrical necessities of war. This precluded giving as much thought and labor to the compilation of papers as is ordinarily possible.

It may be of interest to state the basis on which papers have been judged for the last several years. The basis is as follows:

Value to the industry..........	50 per cent
Originality	25 per cent
Literary merit	25 per cent

The papers chosen for the awards this year are as follows:

Winner of Doherty Medal—Distribution Engineering Economics—G. M. Armbrust, Commonwealth Edison Company Section.

Winner of Billings Prize—Inspection Engineering—A. F. Bronwell, Commonwealth Edison Company Section.

Honorable Mention—Methods of Cooling Transformers—V. E. Alden, Baltimore Gas and Electric Company Section.

The paper on "Distribution Engineering Economics," winning the Doherty prize, is of importance because of the very large investment represented in the distribution systems of all our companies. The author briefly shows methods to determine the economical size of conductors for alternating current and direct current feeders and transmission lines and shows how these results change with varying forms of load curves and with price levels of material.

"Inspection Engineering," the paper receiving the Billings prize, is not a technical paper, but treats of a subject which interests all companies, showing the necessity of inspecting new electrical installations and indicating that such inspection is for the customer's ultimate benefit as well as for the protection of the supplying company.

The paper "Methods of Cooling Transformers" is a high-class paper and would have been given at least second place but for the fact that it deals with a subject of value only to transformer designers and cannot be of general application to our electric companies.

FUTURE PAPERS

The Committee believes that definite means should be taken to stimulate interest in the production of high-grade papers for the coming year in all of our Company Sections. There is no doubt that the writing of high-grade papers is valuable to the individual, the department and the company from which they emanate. The better papers from those competing will also be of value to the Association and industry as a whole.

The Doherty and Billings prizes are in themselves an ideal method of producing interest in the preparing of papers. Some of the member companies have additional prizes of their own for papers of merit submitted by their employees, and such prizes are very desirable.

The Committee would point out, however, that something additional to the giving of prizes is necessary to secure the proper result. The practical way to obtain a considerable number of able papers is for the management of each member company to let it be clearly understood by department heads that such papers are desired. Department heads should in turn let employees know that good papers will be welcome. They should go so far as to suggest to individuals in a position to produce such papers that they take the necessary time and collaborate with others to produce papers of merit.

Now that normal conditions are returning, the Committee urges that an active campaign be taken up during the coming season for the production of competing papers by every company, and we suggest that the Committee on Company Sections make a monthly check of the activities of member companies in this respect and take the necessary measures to encourage and secure such papers.

Respectfully submitted,
A. S. Loizeaux, *Chairman.*
T. I. Jones.

Mr. Loizeaux: The Committee desires to urge that in the future the companies make a real effort to get out more and better papers in the Sections. We consider that it is a matter of real benefit to the companies, and that it is a matter of education to the young men who can be encouraged to put out these papers.

I was impressed by a statement in one of the Atlantic City pamphlets that Mr. Heinz said his success was due to work plus publicity, and I think that our young men who have worth ought to be encouraged to write and obtain the necessary publicity for their own success and the benefits of the companies with which they are connected.

The President: If there are no objections this report will be adopted.

The President: The next business will be the Report of the Committee on the President's Address.

(Vice-President Ballard in the Chair.)

The Chairman: Mr. C. L. Edgar will present the Report on the President's Address.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS

Your Special Committee has carefully considered the very able address presented by President Wells at the opening of this Convention. It recommends that you carefully reread this excellent analysis of the present situation and also that it be given currency in your respective organizations. Your attention is particularly called to the references to socialism and municipal ownership, in which form socialism finds expression in its effect upon our industry, and also to the paragraphs relating to service rendered to the public and to conditions and advantages which should be enjoyed by those employed in this industry. Your Committee believes that these suggestions of President Wells should receive your special endorsement and recommends that resolutions be passed by this Convention requesting your Executive Committee to consider promptly what action the Association should take at this time to assist its member companies in combating municipal ownership and also consider how it can best promote in its membership an appreciation of the importance of striving to maintain the highest standard of service at reasonable cost, the fairest relations with the public which it is privileged to serve, and the most modern and just relations between management and employees, to the end that we may make progress in efficiency and the favorable opinion of the public, which is the surest way of protecting the properties in our charge.

C L EDGAR, *Chairman*
J E DAVIDSON
J E GILCHRIST

MR. EDGAR: I would, therefore, move that this Convention call this report to the attention of the Executive Committee for such action as it desires to take.

(Motion seconded and carried.)

(President Wells in the chair.)

THE PRESIDENT: We will now have the Report of the Committee on Resolutions, Mr. Arthur Williams, chairman.

ARTHUR WILLIAMS, New York: Before I present this report, may I ask your indulgence to speak of another matter and offer a resolution? If the members of this Association have in mind that which is latest in regard to compensation and in regard to the care of injured employees, and legislation bearing upon relations between employer and employees, they will find that our own industry is squared with the best modern thought on that subject, as was set forth some time ago in a report which was prepared by a committee of which Mr. Charles L. Edgar was chairman. The committee worked two days in Washington, in preparation of that report, going to that city that it might be uninterrupted in its consideration of the subject.

At present there is no more important matter before us than the question, not of what is "policy," but of what is ethical and just in our relations with labor. It is a subject upon which the thought of the world today is concentrated. I would, therefore, move in this connection that the President be requested to appoint a committee to consider the question broadly during the coming year as to what is ethical and just in this matter, for the guidance of our industry, and I would venture the suggestion, as that very remarkable work to which I have referred was done under the direction of Mr. Edgar, that, if possible, the services of Mr. Edgar be secured as chairman of that committee. I make a motion to the effect that the President be requested to appoint such a committee.

W. C. L. Eglin, Philadelphia: I should like the privilege of seconding Mr. Williams' motion and of saying a further word. I hope when the committee is appointed—and I endorse Mr. Williams' idea that Mr. Edgar be enlisted in this work—that the whole scope of labor will be studied, particularly with the thought of suggesting, as has been done by several committees at this Convention, that some profit-sharing methods which would apply to all employees of utility companies be considered. I do not know whether you have noticed the fact that that thought is more or less running through a number of different Committee reports which have been presented at this Convention, and I hope our Association will be the first national association to study properly the relation of labor in all of its phases to our industry.

A. S. Loizeaux, Baltimore: I suggest that when the committee investigates the wage or compensation of labor it investigate also the wage of weekly and monthly employees as well as the wage of labor paid by the hour.

The salaried employee has shown much patriotism throughout the war and much fidelity to his employer by sticking to his work with little wage advance while the cost of living mounted steadily.

The trade unions have demanded and obtained wage increases corresponding with higher living costs. It is, therefore, only just that salaried employees should be raised to a new wage level corresponding to these higher living costs. This change, if made spontaneously by the electrical industry, would reflect much credit to the industry, while if not granted might result in unionizing clerical and other occupations or be ultimately raised by the slower operation of the law of supply and demand.

(The President put the motion, which was duly carried.)

The President: We will now have the Report of the Committee on Resolutions, which will be presented by Mr. Arthur Williams, Chairman.

REPORT OF THE COMMITTEE ON RESOLUTIONS

WHEREAS this, the Forty-second Convention of the National Electric Light Association, has proved most successful in bringing together a large representation of the member companies and in presenting for their consideration an unusually inspiring and valuable program,

RESOLVED that the Association extend its special thanks and appreciation

To the retiring President, Mr. Walter F. Wells, for the devoted services he has rendered during the past year and for the prosperity of the Association under his administration.

To the Secretary, Mr. T. Commerford Martin, whose first absence from our meetings in many years is noted with deep regret—whose speedy recovery to full health is greatly hoped; to the Acting Secretary and to the entire office staff for faithful, unfailing service.

To the Mayor of Atlantic City, the Honorable Harry J Bacharach, who opened the Convention and who, with his associates in the administration of the city, has done everything possible to make our visit pleasant and successful.

To the Hotel Men's Association, and particularly to the Convention Committee, of which Mr. A. T. Bell is Chairman; to the hotels of Atlantic City which have provided such ample and satisfactory accommodations for our membership.

To the Atlantic City Electric Light Company, Mr. R. E. Breed, its President, and to the representatives of the company who have assisted in perfecting the Convention arrangements.

To Messrs. George Otis Smith and E. E. LaSchum and Professor Joseph W. Richards, who as guests of the Association presented interesting and valuable contributions to our Sessions.

To those in charge of the Lighting Exhibit—the most extensive and valuable demonstration of the kind—which was made possible through the united efforts of the Lamp Manufacturers, the Lamp Committee and several of our member companies.

To the various Committees of the Association, composed of representatives of our member companies, for the time they have given and the thought they have expended during the year in the various departments of the Association's work.

To the authors of papers presented at the Convention, all of which will add materially to the efficiency with which the industry may be conducted.

To the Exhibition Committee and to the manufacturers, through whose cooperation an exhibit has been made—the most interesting and instructive that has yet been given under the auspices of the Association. It is particularly fitting that should be so at this Convention, for it was at Atlantic City thirteen years ago that the first exhibition of this kind was made under the auspices of the Association.

To the Entertainment Committee, which has done so much to make this meeting in every way attractive, not only to members, but to the members of their families and their guests.

To the Program Committee, under which the arrangements of the sessions and the mechanical preparation of the program have been executed with unusual skill.

To the Transportation Committee for the arrangements for the transportation of our members, especially those coming from a distance.

To the Hotel Committee which very successfully made and cared for a registration almost a thousand in excess of the preliminary figures.

To the *Electrical World* for the Convention Daily, through which the sessions and Convention activities were so admirably reported.

There may be other committees to which credit should also be given; our thanks are expressed to every committee and to every individual contributing to the success of this Convention.

A word of thanks should also be expressed to the United States Railroad Administration, and particularly to the Pennsylvania System, for the efficient manner in which accommodations have been placed at the Association's disposal—the Pennsylvania System placing an official at the pier to facilitate our return transportation.

Respectfully submitted,

ARTHUR WILLIAMS.

THE PRESIDENT: If there is no objection, the report will be adopted.

THE PRESIDENT: We will now have the Report of the Nominating Committee, Mr. Louis A. Ferguson, Chairman.

LOUIS A. FERGUSON, Chicago: Mr. President and Gentlemen, The Nominating Committee is pleased to submit the following report:

REPORT OF NOMINATING COMMITTEE

For President, R. H. Ballard, Southern California Edison Company, Los Angeles, Cal.

First Vice-President, Martin J. Insull, Middle West Utilities Company, Chicago, Ill.

Second Vice-President, M. R. Bump, Cities Service Company, New York, N. Y.

Third Vice-President, F. W. Smith, The United Electric Light & Power Company, New York, N. Y.

Fourth Vice-President, Walter H. Johnson, The Philadelphia Electric Company, Philadelphia, Pa.

Treasurer, H. C. Abell, American Light & Traction Company, New York, N. Y.

MEMBERS OF EXECUTIVE COMMITTEE, THREE-YEAR TERM

W. H. Atkins, The Edison Electric Illuminating Company of Boston, Boston, Mass.

P. G. Gossler, A. B. Leach & Company, New York, N. Y.

D. H. McDougall, Toronto Electric Light Company, Toronto, Canada.

MEMBER OF EXECUTIVE COMMITTEE, TWO-YEAR TERM

R. J. McClelland, Electric Bond & Share Company, New York, N. Y. (To fill vacancy caused by nomination of H. C. Abell for Treasurer.)

Respectfully submitted,
L A FERGUSON, *Chairman*
H L DOHERTY
CHARLES L EDGAR
W W FREEMAN
JOSEPH B MCCALL

(The nominations made by the Committee being seconded, the President called for any further nominations from the floor. There being none, a motion was made, seconded and carried, authorizing the Secretary to cast one ballot for the election of the nominees proposed by the Committee. This being done, the President declared these gentlemen duly elected.)

THE PRESIDENT: Kipling has said:

"East is East, and West is West,
And never the twain shall meet."

But this is a case where the East and West are going to meet, and although President-elect Ballard is right beside me, I will ask Mr. Edgar and Mr. Williams to escort the newly elected President to the Chair.

PRESIDENT-ELECT BALLARD: For the honor which you have deemed it wise to confer upon me I am deeply grateful. In expressing my appreciation I am not unmindful of the fact that it is a tribute to the growth and importance of the Pacific Coast of our country, and an expression on your part of your real desire for a united industry throughout the length and breadth of our great land in one common purpose—service to the public—the kind of service, broad and comprehensive, which President Wells referred to, satisfactory service to contented consumers, satisfactory service in every point of contact with the public, even service before profits.

The keynote of this Convention is unquestionably this—broad, comprehensive, earnest, honest service.

I think it would be well if each of our member companies, from time to time, during the next year, and as soon as possible, would let it be known to the public that this is the purpose of our Association, and that it is the purpose of each member company of this Association. Let us go out from here with the determination to take full advantage of the opportunity now presented to us, in my opinion the greatest opportunity in the history of the electrical industry, to demonstrate the soundness of private operation of public utilities. You have selected a president who is resident some four thousand miles from headquarters. It will follow that this president, more than any other president of the past, will require and expect your most earnest cooperation to make this next year a truly successful one in spite of this long distance between our respective places of abode.

I am hopeful that during the year our affairs will so shape themselves that when the time for the next Convention arrives we will all feel that it will be profitable to all of us and to the industry for the next Convention to come to the Pacific Coast.

Come to Southern California! that land of great industrial opportunity, the land of sunshine and flowers, where fogs and rains are conspicuous by their absence—in the month of May. (Laughter and applause.)

Due to the enthusiasm of the reception received by your new President, and for fear of spoiling that good effect by a lack of preparedness, I will ask Mr. Wells to continue with the program. (Laughter and applause.)

THE PRESIDENT: Mr. Baily has a matter he desires to present.

E. A. BAILY, Brooklyn: At the meeting of the Accounting Section yesterday afternoon Mr. H. M. Edwards, of New York, called the attention of the meeting to an article by George N. Webster, of New York City, upon the subject of Theoretical Depreciation. The article came to his attention so recently—in fact, it is understood to have been written within the last week—that it was impractical to secure a place for it in the program; for this reason it was but very briefly abstracted and was ordered printed at length in the report of the Proceedings.

The article points out the destructive effect of the application of the theory of the professional depreciationist of "cost less depreciation" upon the interests of our stockholders in determining the investment in rate cases. It is desired that the attention of the entire Convention be directed to Mr. Webster's article on this, the most important subject before the companies today, that we may combat this false doctrine which aims to destroy millions of investment.

We have a limited number of copies here available for distribution as far as they will go, but we are advised that anyone may secure a copy by addressing Mr. George N. Webster, 60

Wall Street, New York City, and it is urged that you secure a copy for yourself and call it to the attention of your attorneys.

THE PRESIDENT: I now declare the Fourth General and Executive Session of the Forty-second Convention of the National Electric Light Association adjourned.

PRESIDENT WELLS

Mr. Walter F. Wells was born at Rahway, New Jersey, in 1870, was educated at Rutgers College, and joined the Brooklyn Edison Company as a draftsman in 1892. From 1894 to 1897 he was electrical superintendent of the Company, resigning to become assistant general manager of the Manhattan Electric Light Company, one of the pioneer alternating current, electricity supply companies of Manhattan. When the present New York Edison Company was formed, Mr. Wells was made one of the district superintendents of the operating department. He superintended the installation of the electric plant at the immense Waterside station at Thirty-eighth Street and East River, and upon its completion became superintendent, in general charge of its operation. He returned to Brooklyn in 1905 as general superintendent of the Brooklyn Edison Compay, in charge of a great many of its activities. On January 3, 1913, he was elected vice-president and general manager and director. He is also vice-president and general manager and director of the Kings County Electric Light & Power Company, vice-president and director of the Amsterdam Electric Light, Heat and Power Company and a director of the National City Bank of Brooklyn.

Mr. Wells has been active for many years in the National Electric Light Association, having held the offices of treasurer, second vice-president and vice-president. He was also during 1915 and 1916 president of the Association of Edison Illuminating Companies, and has been a prominent figure in the electrical development of Greater New York. In June, 1915, Rutgers College conferred upon him the honorary degree of electrical engineer. He is a fellow of the American Institute of Electrical Engineers, a member of the American Society of Mechanical Engineers, Franklin Institute, the Illuminating Engineering Society, the Merchants' Association of New York, the Brooklyn Chamber of Commerce, the New York Electrical Society and the Brooklyn Engineers' Club.

DISTRIBUTION ENGINEERING ECONOMICS*

G. M. Armbrust

Doherty Prize Paper

The economical design of a transmission and distribution system is that which provides for the distributing of energy at the desired efficiency, voltage regulation and reliability for the lowest investment and operating expense, and as the system forms a large part of the plant investment, its problems are of considerable importance.

Many specifications of the system are fixed by practical considerations, such as standard voltage, continuity of service, safety, store room stock limitation, etc.; and the problems usually reduce to the proper distribution of lines and feeders, and to the determination of size of conductors.

Theoretically, the economical size of conductor is that in which the sum of the interest on investment in cable, conduit, generating and converting plant, depreciation, taxes and loss of energy in the conductor are a minimum. This can be shown more clearly by a graphical representation of a typical case. Figure 1 illustrates the determination of the economical size of a low tension feeder, assuming an average distribution of load and arrangements of sub-stations as in the down-town district of Chicago, average maximum load of 815 amperes and length of feeder of 800 feet. It is assumed that these factors are practically fixed on the low tension system by voltage regulation and operating conditions. The curves showing totals represent the sum of the following items of cost:—

First:—Annual charges on cable. This is interest on investment, depreciation, taxes, etc., and is 9 per cent of the cost of the cable installed.

Second:—Cost of energy loss in the feeder. The curves of Figure 2 represent the average daily load of a low tension feeder during winter and summer months, also same kilowatt hours at

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*Read before Commonwealth Edison Company Section.

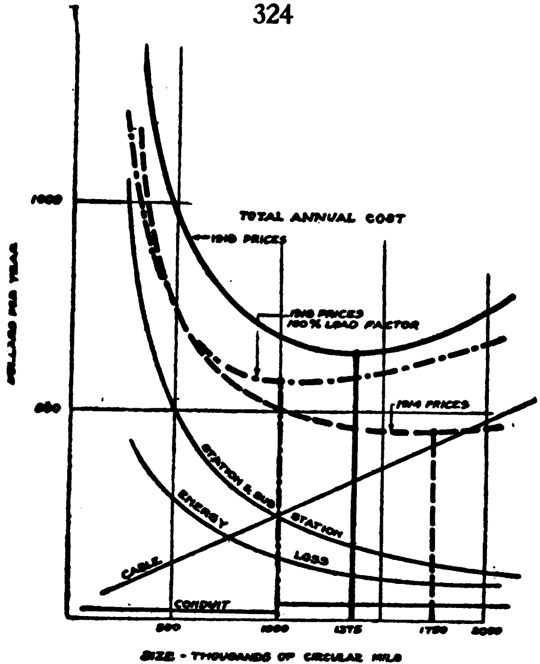

FIG. 1—ANNUAL COST DIRECT CURRENT FEEDERS

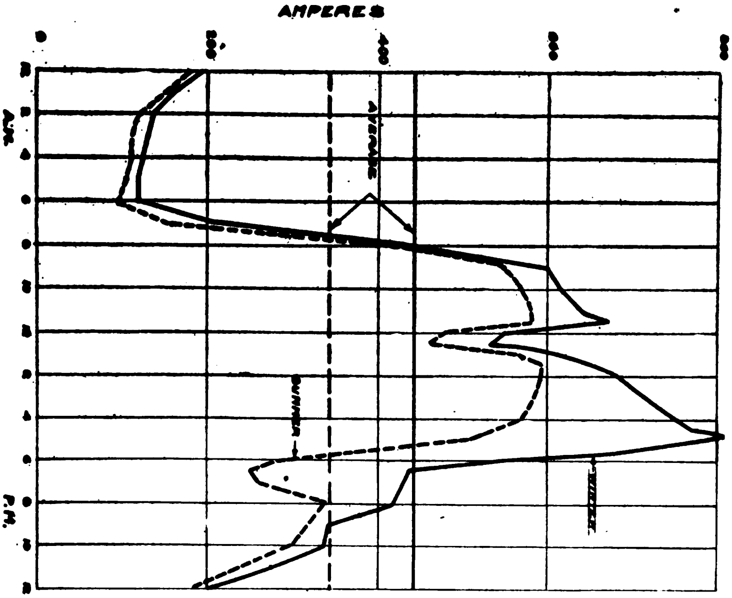

FIG. 2—DAILY LOAD CURVES
DIRECT CURRENT FEEDERS

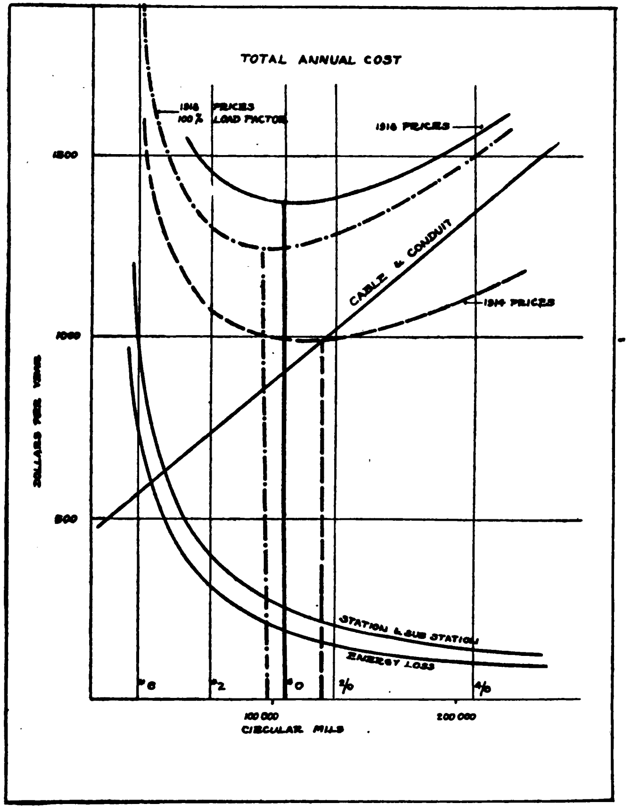

Fig. 3—Annual Cost 4000 Volt Feeders

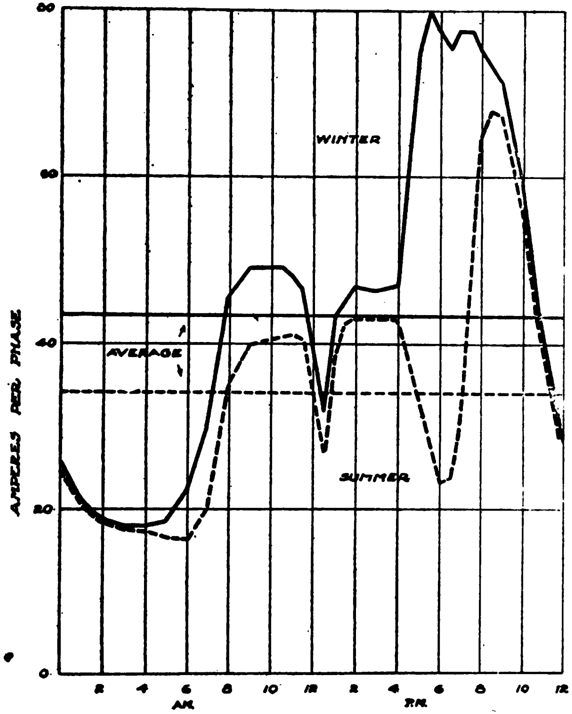

Fig. 4—Daily Load Curves
4000 Volt Feeder

100 per cent load factor From these and load curves of other seasons of the year the cost of energy loss per year is calculated.

Third:—Annual charges, interest, depreciation, taxes, etc., on generating station, transmission and sub-station equipment used to supply these losses.

Fourth:—Annual charges on conduit. From a comparison of these component curves it is evident that the two factors which principally affect the total annual cost of feeders are prices of copper and apparatus and the load factor. The lowest point on the total cost curve, representing the minimum annual cost, shows the most economical size of conductor under the condition considered. From the curve of 1918 prices, this size is 1,375,000 c.m. To show the effect of increased prices of copper and equipment, a similar curve is calculated, based on 1914 prices.

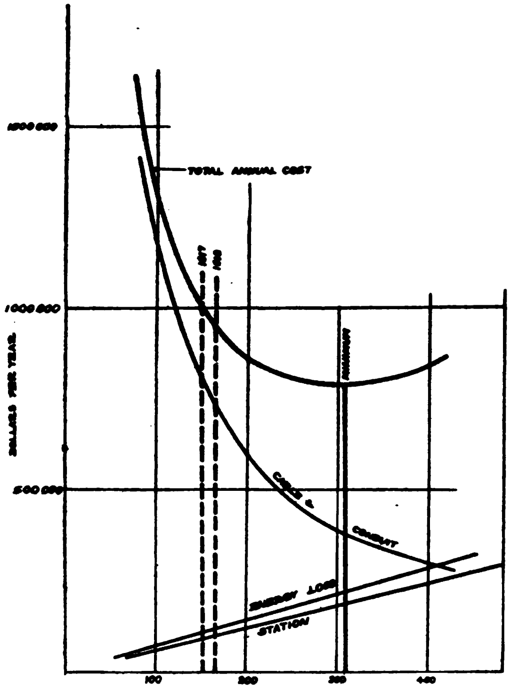

FIG. 5—TRANSMISSION LINE LOAD

Under these conditions the most economical size of conductor is 1,750,000 c.m., or in other words it is economical at the present prices to work the copper at a 25 per cent higher current density.

The diversity between customers or circuits, and the variation in demands of customers, in character of load, and season of year, affect the load factor or shape of load curve, and thus the amount of loss in feeders. This may be illustrated by considering the cost of carrying the same annual kilowatt-hour output shown in Figure 2, but at 100 per cent load factor. The effect is to cut off the peak of the curve where the energy loss is greatest. From the losses calculated from the average 24 hour loads and 1918 prices, the third total cost curve is obtained, Figure 1. On account of the lower energy loss, that portion of curve most affected by these losses (the smaller sizes) is low-

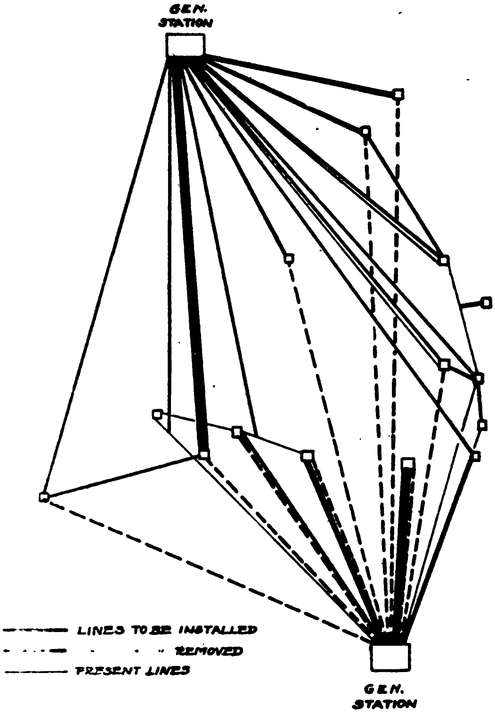

Fig. 6—Transmission Line Changes
1918

ered and minimum total cost is at 1,000,000 c.m., or a still smaller size of feeder would be economical. However, the variation in total cost within this range of sizes is not great, and the present standard size of 1,500,000 c.m. represents an average of these conditions.

These cases illustrate the factors affecting design of feeders, but the principles used cannot be applied to all parts of the system; for instance, secondary A. C. distribution or L. T. mains with indeterminate loads. Here the size must usually be made larger than economical to secure voltage regulation which will insure maximum life of incandescent lamps and desired quality of service, and to avoid continually replacing cables with other sizes as load conditions change.

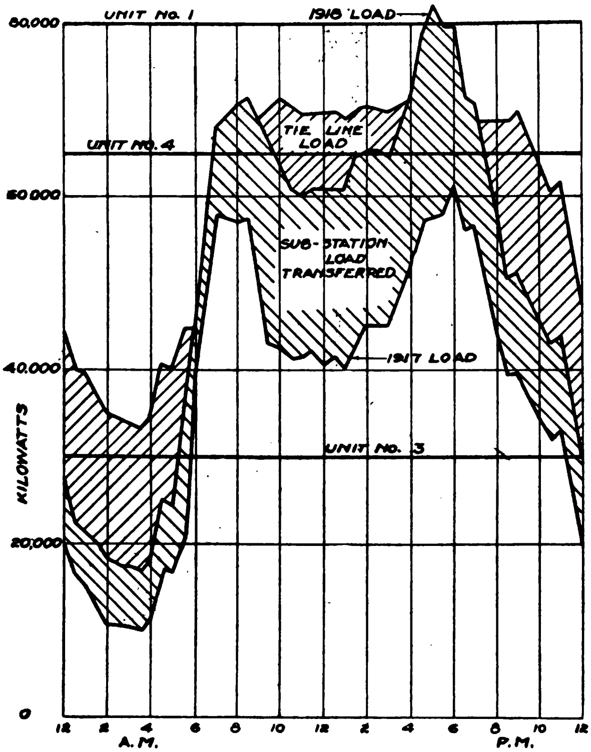

FIG. 7—DAILY LOAD CURVE
NORTHWEST STATION

A similar case has been taken on the 4000 volt system, Figure 3. Assuming the present arrangement and distribution of feeders in Chicago, with an average length of 8200 feet and average maximum load of 525 kw. (Figure 4), and present prices of equipment, the total annual cost per feeder is minimum when the size of conductors is slightly larger than No. 0, the present standard size. Calculating the total cost from the 1914 prices of copper and material shows the economical size of conductor to be about 25 per cent larger. The effect of the load factor is shown by the third total curve representing the cost of a feeder carrying this load under the same conditions except at 100 per cent load factor. This curve shows the economical size to be about 10 per cent smaller than a feeder carrying an average load.

The limitations of voltage regulation and operating conditions which largely determine the disposition of low tension feeders do not restrict the arrangement of the 60 cycle circuits to as great an extent. As shown on the cost curves of the 4000 volt feeder, the annual charges on cable and conduit form a larger proportion of the total cost than in the case of the low tension feeder, so that with an arrangement of circuits which would concentrate more load at the feeders' centers, a more economical disposition of feeder copper could be made. On account of the greater proportion of total cost of 60 cycle feeder being in cable, as compared with the low tension feeder, it is economical to load the 60 cycle circuits to a higher current density, 0.777 amperes per 1000 c.m. compared with 0.593 amperes per 1000 c.m. in the low tension feeder, or 32 per cent higher.

Figure 5 represents a calculation to determine the economical load per line of the transmission system of Chicago. In this case the factors which are fixed are the location of generating stations, character of load, radius to which it is to be transmitted, transmission voltage, and the fact that there is now in service a large amount of cable of an average size of 250,000 c.m. The problem is to determine the economical load per line and thus the proper arrangement of lines. The curves representing line and station charges and energy losses are therefore plotted as functions of the load per line in this case. As in the case of the 4000 volt feeder, the line charges are the largest portion of the total cost, in fact within certain limits the line charges become a still greater portion of the total as the voltage increases.

The most economical load per line per phase as shown on the total cost curve is slightly more than 300 amperes, with the present prices of copper and energy. The station changes are lower than the cost of energy loss in this case, as no substation equipment is chargeable to this system.

The average maximum load per line in 1917 was about 150 amperes per phase per line, and the difference between this load and 300 amperes represents, as shown on the curve, about $200,000 loss per year. All of this difference cannot be saved as operating conditions will not permit carrying this load per line, but if the load were limited to 200 amperes per line, most of the saving would still be available.

The point 1918 on this curve represents the results of this year's line changes and shows a saving of about $40,000 due to the increase in line loads. This still leaves a wide margin for increased efficiency in transmission. This further increase partly depends, however, upon the installation of relays for the parallel operation of lines to provide the reserve now obtained from spare lines. This spare cable can then be used to increase further the efficiency of the system.

In addition to this reduction of annual transmission cost, a still greater saving in operating costs will be made by this year's changes, by transferring a considerable portion of Fisk Street Station's load to the Northwest Station. As shown on the diagram of lines, Figure 6, a number of lines are to be removed from Fisk Street and installed from Northwest Station. On the 25 cycle system, 9 lines are being removed and 5 installed, resulting in an increased load per line and the transferring of an average of about 20,000 kw. of Fisk Street load to Northwest, and an arrangement of the lines by which it is possible to transmit an average of 15,000 kw. from Northwest to the Fisk Street bus.

The reason for this shift is the far greater economy of the new generating units at Northwest Station which will be in operation this year and the fact that war conditions made it necessary to postpone the installation of new units ordered for Fisk Street. This change will result in loading the economical generators almost up to their capacity and shutting down some of the smaller units at Fisk, Quarry and Grove Street Stations.

Composition load curves, typical of the various seasons of the year, are made up from load curves of the substations affected, and from these the total amount of energy to be transferred is calculated, the result of which is shown in Figure 7. This amounts to about 210 million kw-hrs. per year transferred. Due to the better efficiency of these generators, the total gross saving per year is $263,000 or about $700 per day.

The cost of this rearrangement of lines consists of the removal and installation of approximately 265,000 feet of 4/0 and 250 cable and amounts to about $65,000 including value of cable lost in transfer. As the work probably will not be completed before October 1st, about $80,000 of the gross saving will be made this year; more than the actual cash outlay required to do this work.

A large part of this saving depends upon operating the tie lines between stations at their maximum capacity. It has been determined by their operation during recent winter months that they may be loaded continuously to 85 per cent or more of their maximum rated capacity during average winter weather without exceeding temperature limits of the cable. During the summer months this rating is reduced to 50 per cent of the maximum capacity on account of the lower rate of heat radiation of cables in warm weather.

Much of the success of this scheme is due to the ingenuity of the Cable Division of the Street Department, in devising means of transferring the cable economically, without injury to insulation, and in designing duct splices which permit using practically any length of cable.

The principal objections to the scheme have been:

First: Injury to cable in pulling out and transferring.

Second: Waste of cable of short lengths.

Third : Desirability of leaving cable in place for future use even though not at present available for use.

The first two objections have been overcome by the Cable Division and the third by great saving in operating cost by loading the cable to its maximum capacity.

INSPECTION ENGINEERING*

By A. F. Bronwell

Billings Prize Paper

The duties of an inspector of electrical wiring are somewhat diversified and not always exactly what the name implies. Primarily his duties involve the inspection of the electrical installation of the prospective customer. This inspection is made not only from a standpoint of the observance of the rules of the company, but also to expedite the proper connection of our service to the customer's load, bearing in mind certain factors known to be prejudicial to the best interest of the customer, some of which I shall shortly mention.

Electricity today is beyond the question of a doubt, man's best servant. Its subtle response is instantaneous. There is no evolution known to science to which it cannot be adapted, but like any delicate or sensitive instrument, it must be thoroughly understood and properly handled in order to acquire its utmost usefulness. Electricity is the safest known artificial illuminant, closely rivaling the sun. It is the safest known source of energy for driving our wheels of industry, but with the phenomenal growth of the central station industry and the consequent enormously increased output of power, few, if any, of our customers today have any idea as to the true amount of power available in the wires on their premises. It is almost inconceivable for them to believe that there is contained in that small wire an energy equivalent to that of a monster engine of thousands of horse power capacity.

It is, therefore, the solemn duty of the inspector to see that the customer is protected in every way, if those whom he engages are insufficiently informed or incompetent to install properly the electric facilities on his premises. The inspector is in a measure the customer's adviser, informing him as to whether or not the work has been rightly installed. Not only must the wiring be installed in a safe manner, but there are other factors to be taken into consideration, such as the continuity of service and the proper kind of service, which are to a considerable extent dependent upon local conditions.

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*Read before Commonwealth Edison Section.

Our company, like other concerns, has widely stipulated certain conditions under which we will furnish electricity to a customer. Not only is this essential for our own protection, but for the protection of the customer as well. While the general trend in the commercial world has been toward specialization, ours today is toward standardization. This is being brought about by a systematic method of educating the consumer and those who have to do with the designing and installing of apparatus to be connected to the central station service, endeavoring as far as possible to create and maintain a unified practice in the rapidly developing industry. In order to accomplish this purpose more effectively it was found necessary to compile the information and instructions in some readily accessible form to be used as a reference or guide.

Our book of "Rules and Information" is recognized as an authority on the subject, not only in this city but throughout the entire country, and copies of it may be found in several of the larger technical schools and libraries in this and even foreign countries. This book was compiled from the accumulation of a mass of data secured from actual experience during years of gradual development. A careful study of these rules reveals one fact which would not ordinarily be looked for or expected, and that is that they are almost entirely in the interest of and for the protection of the consumers in general. Many of the early, and to some extent present, troubles which were encountered have been due to lack of knowledge of the various requirements.

It is important that not only the inspectors but other employees as well, especially those who have relations with the public, be familiar with these rules for the reason that it is only by thoroughly understanding the underlying motive for the adoption and enforcement that they can be intelligently explained to the public. As stated before, practically all of the rules in our book are in the interest of the consumer. For example, take the rule requiring that wiring in apartments and residences in excess of 2640 watts or 48 sockets, or 1500 watts in places of business, be wired for a 3-wire service connection and a 3-wire meter. We have found that beyond these limits improper voltage regulation occurs, and if this rule were not enforced the customer would not be getting the class of service for which he is paying and to which he is entitled.

Then again we have the rule limiting the size of an alternating current motor permitted on the 115 volt or lighting service, which is also for the customer's protection, as not only his lights but those of others in the vicinity would be affected from the operation of the motor. As in this instance, it sometimes becomes necessary to enforce certain restrictions which from outward appearances would seem to be imposing a hardship on a particular consumer, but which are necessary in order to protect the interests of others. It is therefore obvious that it is not the rule but the interpretation of it that may cause a misapprehension.

While we are protecting the interests of the consumer, it is at the same time essential that we retain the good will of the electrical contractor, which can be done only by cooperating with him to the extent of getting our service connected with as little delay as possible. There was a time when the contractor contested the authority of the utility company to promulgate and enforce rules in addition to and separate from those covered by city ordinance. Our company, however, through the Inspection Bureau, has been able to eradicate this feeling and has through persistent effort been able to bring about a spirit of friendliness, thus co-ordinating our efforts to the benefit of the consumer. We have received a great deal of assistance in this matter from the City Council and the Department of Gas and Electricity of Chicago in passing an ordinance requiring that all persons engaged in electrical contracting within the city be compelled to apply for and secure a license, which is issued only upon the production of satisfactory proofs that the person applying is thoroughly competent and can be held responsible for the work installed. This has to a great extent eliminated the so-called "push button" electrician, who flitted about with his office in his hat and who complied with our rules only when compelled, because if he did he lost money on his work.

As a result of the cooperation which we are receiving from the contractors, it is gratifying to note that out of the total number of applications at this time pending in the Distribution Division, less than three per cent are being held on account of changes required by this company. It is, therefore, apparent that service to customers is not being delayed because of failures to comply with any rules which this company enforces, and it is self-evident that the contractors appreciate the value of this cooperation and are assisting in preventing any unnecessary delay. These figures might have been further reduced had the inspector in all cases been able to make inspection before the wiring was completed and thus have issued instructions preventing a violation. Of the cases now pending because of noncompliance with our rules, sixty-six per cent had been completed before the inspector called. Where it is possible for an inspector to call before the wireman has completed and left, he can materially assist by suggesting such changes as may be necessary, which can at that time be made without extra cost to the contractor; then invariably when the final inspection is made there is no delay to the customer. It is, therefore, important that the prospective customer make his application for service as early as possible and before the wiring has been completed.

A classified summary of the total number of applications pending in the Inspection Bureau is both interesting and instructive because it gives a working basis for possible improvement. In presenting these figures I will not enlarge or dwell upon any particular phase but will give them to you for consideration.

Applications pending	1062	
Wiring either not started or not completed	545 or	52%
Fixtures or motors not installed	230 or	21%
Premises locked, unable to make inspection	42 or	3.9%
Service and line extension	71 or	6.6%
Awaiting approval of Dept. of Gas & Electricity	127 or	12%
Changes required by this company:		
Inspector called before completion	16 or	1%
Inspector called after completion	31 or	2%

The following figures indicate the average number of days required for the completion of the several steps.

Average number of days pending for:	
Service and line extension	9
Changes required by this company:	
Inspector called before completion	12
Inspector called after completion	15
Approval of the City of Chicago	23

While these figures cover all applications and present a fair average of both large and small consumers, there are other factors in connection with the larger consumers not met with in the smaller installations. Here a more complicated situation arises, especially with the Schedule C consumers.

It has been recognized that because of special conditions, each peculiar in itself, these cannot be handled in the regular routine manner. All Schedule C applications and such of the Schedule A & B as may later come into this class are therefore handled by special inspectors, known as supervisors, in order that each may be worked out with regard to engineering features to be met with in this class of work. The necessity of specialization in this matter was not recognized until about four years ago on account of the small number of such customers, but as the rates of electricity were lowered, the consequent increase of Schedule C consumers became so enormous as to require special attention.

In a general way with the smaller consumers there are but two factors to be taken into consideration, that of the contractor and of the consumer; whereas, in the larger installations a third factor, the architect, has an important bearing, and it was partially due to this third factor that special attention was thought necessary. This third factor becomes the most important because it is in his office that the conception is first given for perhaps months or even years before any mechanical move is made.

It was found that it was practically a waste of time to deal with the contractor in these cases as he had followed the specifications and instructions of his contract to the letter, and to consult with the architect meant considerable delay and possible rebuffs and unpleasant controversies, which were not conducive to the best interest of all concerned.

Considerable time and diplomacy were required to bring about a source of order from the existing chaotic conditions. It meant that in order to secure the same degree of results that could be obtained on the smaller jobs while they were under construction, it was necessary to start with the plans in the architect's office. The number of architects who employed consulting engineers was confined to two or three of the larger. Of the others several were geniuses in their architectural ability, designing mammoth structures which would stand as a monument to their name, but in electrical engineering they knew not the fundamental elements. Is it any wonder then that they made use of stock specifications, changing them here and there a bit in order to make them fit the plans at hand; something like painting an old worn out engine in order to make it harmonize with the modern decorations of the engine room, and the central station company has the job of making it run. Our Repair and Meter Testing Departments are today heaving sighs of relief as one after another of these old buildings are making way to others of more modern construction.

The architect's office, however, was the seat of authority and to offer him advice as to how a switchboard should be constructed was equal to suggesting points of law to a justice of the supreme court. We have finally, through continued effort and tactfulness, been able to secure a chair at the consulting tables of the majority of architects doing business in this city, to the extent that we are now approving the drawings for all switchboards being installed in buildings to which our service is to be connected. There is also a gradual growth in their demand for the consulting engineering service which our company supplies them without charge. It is a fact that we occupy a peculiarly favorable position to offer this service because with our unlimited resources for research, and from past experiences, which have brought us directly in contact with the actual results of ideas of the other engineers, we are enabled to take advantage of the better points of different ideas and avoid others which have not proved successful. Because of this prestige we are not only in a position to assist in giving the customer a more flexible electrical installation, but one which approaches nearer the ideal and assures more nearly continuity of service.

It is also a fact that the architects and contractors as well are being benefited, as is evidenced by their increasing confidence and close cooperation. The architect who thoroughly understands the policy of our central station industry, its resources and service, and who is made to realize that they are something more than idle words, becomes a most valuable ally.

Herein lie potentially undeveloped fields which offer excellent opportunities for the inspector to raise the standard of his calling to the high plane to which it is entitled. The work is but begun but the barriers are broken down, and there is opened before us a task which is worthy of the metal of the best, the accomplishment of which will be a much coveted honor in the industrial world.

Outline of the Ideals, Policies and Progress of the N. E. L. A.

1 The National Electric Light Association was organized to foster and promote the effectiveness of the service furnished by electric central station corporations engaged in the production, transmission and distribution of electricity, in supplying the public with light, heat, power and other forms of service. It was believed that the highest economies and efficiencies could be reached only through the effective cooperation of all of the factors engaged in the industry, to which end the Association was founded in 1885. Throughout the thirty years following its inception, it has not only fulfilled its original object, but has taken on many newer and broader duties and responsibilities. So wide, indeed, has become its later sphere of influence and activities for the general welfare, that it has frequently been suggested the Association should change its time-honored name for one which would more fitly express its modern ideals and progressive policies which are being carried out for the common good.

2 No body of men can hold together long or effectively without some accepted and controlling principles. These the Association embodies and voices emphatically. It is in itself a concrete expression of the social and political belief that it is economically unwise for governmental authorities of whatever degree to engage in the ownership and conduct of industrial enterprises. It has also demonstrated that centralization of effort and production, and the greatest possible volume of output, are essential for the greatest economy and efficiency and to provide the maximum expansion, the highest standards of service, and the lowest rates to the public. It has lent its support to the great movement for the conservation of energy and of natural resources. It has favored and promoted reasonable State regulation by Commission rather than wasteful competition as a means of assuring reasonable rates for service. It holds that no instance exists where such competition has not finally been at the expense of the community served, and that a regulated monopoly is the essential condition for best service.

3 The Association is constructed on an unusually broad basis of membership. Full membership is limited to operating companies, which are designated Class A members. This is followed by four classes of associate members: Class B membership comprises individual officers and employees of Class A members. Class C membership includes teachers in institutions of learning, consulting engineers, officials of Public Service Commissions, and others interested in the scientific development of applied electricity. Class D membership provides for manufacturers of electrical

apparatus and mechanical appliances used in connection with electrical supply and service; and Class E is composed of those officers and employees of Class D members who wish to enjoy the many privileges and benefits incident to individual participation in Association work and access to its literature. There is also a growing class of Foreign Members, corporate and individual, from all parts of the world, to whom the useful activities of the Association make a strong appeal, and by whom its publications are eagerly sought. In a special class of honorary members will be found, without distinction of nationality, the names of great living inventors and creative contributors to the art of applied electricity and many who have sought to shape it for the best service of mankind. The details as to all these classes, now representing a total of more than 10,000 members, are minutely set forth in the Constitution of the Association printed herewith, a document which has been conscientiously remolded from time to time to meet advancing conditions, and has thus undergone progressive change toward greater and broader benefit and usefulness to its membership and the public at large. Amendments will naturally be made from time to time as necessary to reflect more absolutely in its organic law the policies and regulations under which the Association conducts its expanding activities.

4 The Association has a governing organization of peculiarly flexible character insuring progressive development and initiative, its Executive Committee being composed of the President—holding office for one year only—four Vice Presidents, nine Class A or B members, elected by the annual convention to the number of three each year, the Treasurer, the retiring President, and the Chairmen of the National Special Sections. To these recurring annually are added the new Presidents or Chairmen of the Geographic and State Sections elected from the various sections of the country affiliated with the National body. There is thus provided as an inner driving force for the whole Association mechanism, by several processes of selection, an Executive Committee of tried merit and devotion, continually renewed from the whole field of membership, and as far removed from any possibility of conservative inertia as can well be imagined. It may well be claimed that no national engineering or educational body has gone further in the effort to expand its fundamental traditions and convictions and to maintain and strengthen its high qualification for leadership in the liberal aspirations and achievements which, for nearly 50 years, have marked the successive and successful efforts of public utilities in the electrical field to give the best service at the lowest possible cost to the public.

5 The National Electric Light Association is a complex body as to membership in that, while it represents the industry at large through the election of its chief officers on the open floor of the annual convention, it is a composite of Geographic and State Sections, each of which has representation on its governing Executive Committee and a voice in the management.

6 The engineering and attendant scientific and educational work of the Association is carried on through appropriate sub-divisions or sections of the National organization known as the Technical and Hydro-Electric Section, the Commercial Section, the Accounting Section, and the Electric Vehicle Section. No person is eligible for membership in any of these or in any other National Special Section who is not a member of the Association itself. By far the largest specialized group of this kind within the Association is the Technical and Hydro-Electric Section. Each Section issues its own volume of annual Proceedings, which comprises the report of its sessions at the last preceding annual convention, marks the high tide of progress and becomes the most advanced text book in that branch of the art.

The effective working and the continuous usefulness of the Association depend not more upon the administration at headquarters and the guidance of the Executive Committee than upon the vigilant assistance of the numerous standing and special committees of the Association and its National Special Sections. Of these committees there are now about 70 with some 500 leading experts in their membership. If to these are added the corresponding and kindred committees in the Geographic Sections, a total is reached of at least 1000 men in the industry who, without compensation, are devoting their best thought to the development of the art and the consequent benefit to the public. Not only does this service find expression in valuable annual reports that are the landmarks of progress, but in quick and prompt assistance given to members in the solution of pressing problems of the hour, as well as in Handbooks which are permanently valuable contributions to the literature of electricity, and have received very wide appreciation not only from public utility companies and their employees, but from college professors and college students engaged in the engineering courses of colleges and technical schools. The Public Policy Committee devotes its energies especially to the study of Public Service Commission relationships, welfare work, insurance, sick, death and relief funds for employees, profit sharing for employees, stock ownership for customers and employees, savings funds, accident prevention, and in general the whole range of social economic questions that are in the forefront of modern thought. Every other committee in like measure deals with the problems in its field and does much to bring them nearer the settlement which, once reached, is only a point of a new evolutionary departure.

7 The work of the Association is promoted primarily and principally by educational methods. By far the largest part of its income in dues is returned to its membership in the form of educational publications. In 1917 its five volumes of *Proceedings* reached a total of 2500 pages, than which no better collection of engineering and industrial data exists. Each member company receives a complete set of *Proceedings* and each individual member receives the special volume or handbook of each Section with which he is identified. The *N. E. L. A. Bulletin, issued*

monthly, goes to each member as a subscriber. It carries no advertising. It contains not only the current news of the industry and of its latest developments and of the Sections—National, Geographic and Company—but is supplemented by a Question Box to which hundreds of correspondents contribute on all kinds of subjects that provoke inquiry and call for prompt decision and data. The *Proceedings* and the *Bulletin* are furnished free to about 120 institutions of learning in this country so as to be accessible to the many engineering students, some of whom will later become central station operators. The Association also publishes, free to its individual members, valuable educational *Handbooks,* such as those on Overhead Construction, Meters, Accounting and Salesman's Data, the last named being in loose-leaf form, and all being constantly brought up to date. Through its Commercial Section the Association is issuing, from time to time, booklets whose aim is to promote better conditions of service to the public.

8 For several years the Association has been developing through Company Sections and with the aid of its National Special Sections a plan of educational work for the higher training and improved efficiency of the men engaged in the industry. These educational efforts are strikingly exemplified in the successful courses of the Commercial Section in Commercial Engineering and Salesmanship, and in those now planned and authorized by the Accounting Section, but they are also brilliantly illustrated by the vocational work undertaken in several cities by member companies dealing with their employees at first hand in the endeavor to make them not only more effective men, but, on the whole, better citizens. The Association now has over 50 Company Sections in existence, many of them with their own monthly Bulletins, all holding regular meetings, for the dissemination of knowledge, and all inculcating ideals of personal efficiency, enhanced ability to serve and higher standards of public service. The Association maintains, free of cost to Company Sections, a Lecture Bureau to which leaders in the art contribute each year. The Bureau is a very active center each winter in the circulation of these lectures with the aid of "movies" and thousands of lantern slides. To a great many of these meetings the public has the "open door."

9 A healthy stimulus to Company Section activity is given by a series of prizes. For several years Past-President Henry L. Doherty has given a gold medal for the best paper read during the preceding 12 months before any Company Section, and Past-President Arthur Williams has contributed a second prize of $50 cash for the same purpose. Prizes have also been presented by Mr. H. F. Frasse for the best articles or papers on the utilization of waste. Judges selected from the membership pass on these awards, which are watched with the keenest interest and do much good.

10 At a very early stage the Association took part in the now universal "Safety First" movement, and is, at present, cooperating with the U. S. Bureau of Standards to develop and perfect a National

Electrical Safety Code. One of its most notable efforts in this direction was its creation of a National medical commission for the study of resuscitation from electrical shock. Sustaining entirely the expenses of this body, which included the most distinguished medical experts in the country, it formulated and published broadcast a brief set of rules and recommendations on this subject. These have been adopted by the U. S. Governmental departments, State bureaus, great railroad systems, and leading industrialists, have been published by a great many newspapers, and have been translated into many languages and adopted by several foreign authorities.

Certain questions respecting the method and the use of artificial respiratory and auxiliary apparatus have, however, arisen since the Rules were originally issued in 1912, and in 1918 it was deemed advisable to organize a Third Resuscitation Commission to review the work accomplished and to make such further recommendations as the Commission might consider would be helpful. Upon receipt of the proceedings and resolutions of the Commission, the Sub-Committee on Accident Prevention, revised the Rules and also the Chart, which consists of an abbreviated form of these rules, basing the revision on field experience covering a number of years; and while no very radical changes have resulted, changes in detail have been made, which, it is felt, will make the operation of the method more effective, and to which the careful attention of instructors and those familiar with the method is directed.

11 The Association does not "live to itself alone," but ever since it was formed has cooperated with all the other great engineering bodies in various movements, most of which may be summed up under the general head of standardization, for it is through standardization only that the lowest costs of installation and operation can be secured.

12 The National Electric Light Association stands for the broadest and most untrammelled development of the art of applied electricity; for the maintenance of incentive to inventors, engineers and capital in such development; for the conservation of the savings of the investor in the electric central station industry; for the welfare of the employees of the industry; and, above all, through these principles and motives, for the best service and the fairest dealing to the public.

13 In all of its work, in all of its activities and policies, in all of its educational propaganda, in all of its advice to members, and in all of its proceedings the National Electric Light Association stands for and inculcates the policy of wide publicity. It believes in frankness and enlightenment, both among its membership and between its members and all regulating bodies and the public. While it does not and cannot distribute its literature broadcast, it gives all of its publications and reports of its proceedings freely to all public service commissions, to a large number of educational institutions, to many kindred organizations interested in applied electricity, outside of its membership, within the means provided by the funds available for publication purposes.

CONSTITUTION

Article I—Name

This Association shall be entitled the National Electric Light Association.

Article II—Object

The object of this Association shall be to advance the art and science of the production, distribution and use of electricity for light, heat and power for public service.

In the furtherance of this object its activities shall be largely educational and for the fullest development of the electrical engineering arts and sciences in all their branches.

It shall not be engaged in business.

Article III—Membership

Section 1 Members shall be divided into seven classes—Member Companies (Class A), Members (Class B), Invited Members (Class C), Associate Member Companies (Class D), Associate Members (Class E), Foreign Members and Honorary Members.

Section 2 Class A members shall be regularly incorporated public service companies or individuals engaged in producing and supplying electricity for light, heat or power for public use. They shall be entitled, through their regularly accredited delegate, to attend all meetings of the Association, to vote, and to hold office.

Section 3 Class B members shall be officers or employees of Class A members elected or continued from year to year with the written approval of the Class A member with which they are connected. They shall have all the privileges of Class A members, except the right to attend and to vote at the executive sessions of the Association, but shall be allowed to attend such executive sessions upon the written request of the Class A member vouching for their membership.

Section 4 Class C members shall be instructors, teachers or practitioners of engineering and related sciences or of other professions who are interested in the art of applied electricity. They may become or remain members only upon the invitation and approval of the Executive Committee. They shall have all the privileges of Class A members, except the right to hold elective office and to attend or vote at executive sessions.

Section 5 Class D members shall be companies or firms of electricians, electrical or mechanical engineers, manufacturers, publishers, bankers and brokers, or others—corporations or individuals—who are directly or indirectly interested in advancing the use of electricity. They shall have all the privileges of Class A members, except the right to attend and to vote at executive sessions, and except the right to hold office other than in a National Special Section or as representing such Section on the Executive Committee, as hereinafter provided.

SECTION 6 Class E members shall be officers or employees of Class D member companies elected or continued from year to year only with the written approval of the Class D member with which they are connected; or they may be other persons interested in advancing the art of applied electricity, not employed by a company or individual eligible for membership, but proposed and recommended by the Class A member in the territory where the applicant resides. Where no central station recommendation or disapproval can be obtained, applications for membership may be recommended by the president of the Geographic Section or a National Special Section. They shall have the same privileges as Class D members.

SECTION 7 Foreign members shall be individuals or corporations not residents of North America engaged in the central station industry, or directly or indirectly interested in advancing the use of electricity, who shall ally themselves with this Association. They shall have all the privileges of Class A members except the right to vote, to hold office and to attend executive sessions.

Employees of Foreign members are also eligible to membership, but may be elected and continued only from year to year with the written consent of the Foreign member with which they are connected.

SECTION 8 Honorary members shall be elected upon unanimous recommendation of the Executive Committee and approved by a two-thirds vote of the Association. They shall have all the privileges of Class A members except the right to vote, to hold elective office and to attend the executive sessions.

SECTION 9 In case of a corporation the membership shall stand in the name of the company, and such company shall have the right to be represented at any meeting of the Association by any of its officers or directors, or by its regularly employed manager or superintendent.

ARTICLE IV—OFFICERS

SECTION 1 The officers of this Association shall be a President, four Vice-Presidents, an Executive Committee, a Secretary and a Treasurer.

SECTION 2 The President, Vice-Presidents and Treasurer shall be elected from Class A or Class B members to serve one year from July 1st, or until their successors shall have been elected. The President shall not be eligible to re-election for two years after his term has expired. The President shall preside at all meetings of the Association and of the Executive Committee and shall perform such other duties as may be provided for in this Constitution or by vote of the Association. In case of the absence, disability or death of the President, his office shall be filled by the Vice-Presidents, in order of seniority.

SECTION 3 The Executive Committee shall consist of the President and Vice-Presidents, of the Treasurer, and the retiring President, of nine (9) members elected from Class A or Class B, and the President or Chairman of the Manufacturers' Section, and two (2) members elected by said Section. Three (3) of the elective members shall be chosen at the annual Convention and they shall hold office for three (3) years, from July 1st, or until their successors are elected. Each of the above officers and members shall have one vote in meetings of the Executive Committee. The Presidents of Geographic Sections or National Executive Committee Representatives, and the Chairmen of National Special Sections are entitled to attend all meetings of the Executive Committee. The Geographic Sections, through their Presidents in attendance, shall be entitled to two votes and the National Special Sections, through their Chairmen in attendance, shall be entitled to one vote upon all matters acted upon at meetings of the Executive Committee. The Presidents of Geographic Sections or National Executive Committee Representatives in attendance at any meeting of the Executive Committee shall divide equally the two votes to which their Sections are entitled. The Chairmen of National Special Sections shall divide equally the vote of their sections. The President of the Association shall act as Chairman of the Committee.

In case the President of a Geographic Section or the National Executive Committee Representative or the Chairman of a National Special Section is unable to attend any meeting of the Executive Committee, the Executive Committee of his Section may delegate one of its members to represent the Section at a regular or special meeting of the National Executive Committee, but the same special representative may not attend more than two such meetings in succession.

SECTION 4 The Executive Committee shall be the governing body of the Association, shall manage its affairs, and pass upon all applications for membership, and upon the eligibility of representatives, subject to this Constitution and such special rules or regulations as may be adopted by the Association from time to time. Five (5) members of the Committee shall constitute a quorum.

SECTION 5 The Secretary shall be nominated by the President and be confirmed by the Executive Committee. He shall serve for one year from the first of the month following the date of the President's election, or until his successor is appointed and confirmed. He may be a member of any class; shall be eligible for reappointment without limit and shall perform such duties as the Executive Committee may direct, subject to its approval.

SECTION 6 The Treasurer shall perform the duties assigned to him by the Executive Committee and subject to its approval. He shall give a security bond of such sum and with such qualifications as the Executive Committee may from time to time determine. The offices of the Secretary and Treasurer may be filled by the same person.

ARTICLE V—MEETINGS

SECTION 1 The annual meeting shall be held in May or June of each year, unless otherwise directed by the Executive Committee, and in such places and on such dates as the Executive Committee may determine.

SECTION 2 The local company shall not be permitted to entertain this Convention, but all expenses pertaining thereto shall be paid out of the treasury of the Association, subject to the approval of the Executive Committee.

ARTICLE VI—QUORUM

Fifteen (15) Class A members of the Association shall constitute a quorum for the transaction of business.

ARTICLE VII—DUES

SECTION I. The annual dues of Member Companies (Class A) in cities and towns of less than 5000 population shall be $10; in cities and towns of 5000 and less than 10,000 shall be $15; in cities and towns of 10,000 and less than 25,000 shall be $20; in cities and towns of 25,000 or more shall be $25 plus 1-50 of 1 percent of the operating revenues from the sale of electric current by the company for the preceding calendar year.

No syndicate, holding company or other corporation or association controlling or managing electric light companies, and no hydro-electric company or power-supply company supplying current to an electric light company or companies shall be eligible to membership as a Class A member, unless all of its constituent electric light companies or companies purchasing electricity from it are Class A members of the Association in good standing. But if all the constituent electric light companies of any syndicate, holding company or other corporation or association controlling or managing electric light companies, or if all the electric light companies purchasing current from a hydro-electric company or other power supply company, are Class A members in good standing in the Association, said syndicates, holding companies or other corporations or associations and said hydro-electric companies or other companies supplying power are eligible to Class A membership in the Association, and may become Class A members after being duly elected and upon payment of dues of $50 per annum.

SECTION 2 The annual dues of Class B members shall be $5, including membership in a Geographic Section and in a National Special Section. Class B members shall receive, without cost, such publications as shall be approved and authorized by the Executive Committee for distribution through a National Special Section.

SECTION 3 The annual dues of Class C members shall be $5.

SECTION 4 The annual dues of Class D members shall be fixed by the Executive Committee, but in no event shall the dues of any such member exceed $2,500 per annum.

SECTION 5 The annual dues of Class E members shall be $5, including membership in a Geographic Section and in a National Special Section. Class E members shall receive, without cost, such publications as shall be approved and authorized by the Executive Committee for distribution through a National Special Section.

SECTION 6 The annual dues of Foreign members shall be $20, including membership in all Special Sections.

The annual dues of employees of Foreign members, who become individual members, shall be $5, plus a suitable charge to cover the cost of transmission of Association literature; and such individual members will become Class B or Class E members.

SECTION 7 All dues shall be payable in advance and shall cover the calendar year. Any member in arrears for sixty (60) days shall be suspended from all privileges of membership, but may be reinstated when he has paid all outstanding dues. In the event an applicant for Class B or Class E membership shall be elected after July 1st the dues for the remainder of the year shall be $3, which will entitle the member to a copy of the *Proceedings* of one National Special Section and to the *Bulletin* for the remainder of the year.

SECTION 8 Class A members or Class D members who may elect to collect for the Association the dues of their Class B or Class E members upon an instalment basis may do so in accordance with a plan of payment approved by the officers of the Association. In the event a Class B or Class E member leaves the employ of the member company, the member company shall so notify the Association and shall be responsible only for the pro rata proportion of the dues of the member up to the date of such notice.

ARTICLE VIII—ELECTION OF OFFICERS

SECTION 1 At an executive session, to be held on the second day of the Annual Convention, there shall be chosen a Nominating Committee, to be composed of five accredited representatives from Member Companies Class A, in the following manner:

(1) Any accredited representative of a Member Company Class A shall have the privilege of making nominations, and when such nominations are seconded by any other such accredited representative, that nominee shall be one of those to be voted for. Nominations in this manner may continue until a resolution shall be adopted to close the lists. After the lists are closed a ballot shall then be taken. The accredited representative present of any Class A Member Company shall have the right to vote for five (5) of those placed in nomination in the manner previously described. The five (5) nominees receiving the highest number of votes shall constitute a Nominating Committee.

This Nominating Committee shall, at a subsequent executive session, bring in the names of those recommended by it for the several offices to be filled.

The submission of names by the Nominating Committee shall not, however, debar any accredited representative of a Class A Member Company from making nominations for any or all of the several offices to be filled, which nominations, if seconded, shall be submitted for election at the same time and in the same manner as those of the Nominating Committee. Whenever there are more nominees than vacancies to be filled, then, in such cases, the election shall be decided by ballot. When there is no contest for office, the Secretary may be instructed by a *viva voce* vote to cast the ballot for those recommended by the Nominating Committee.

SECTION 2 Vacancies in office may be filled by the Executive Committee, to cover the term until the next Annual Meeting of the Association.

SECTION 3 The Executive Committee, upon application by one or more members of Class A or of Class D, may authorize the holding of such exhibitions and of such contests at such times and places as it may designate and assign. Such exhibitions and such contests held under the auspices of the National Electric Light Association shall be governed by such rules and regulations as the Executive Committee, or its delegates, shall prescribe and may be subsidized by the National Electric Light Association at the discretion of the Executive Committee.

ARTICLE IX—PERMANENT OFFICE

A permanent office of the Association shall be maintained in the city of New York, and shall be located, furnished and governed in such manner as the Executive Committee may from time to time determine.

ARTICLE X—PARLIAMENTARY RULES

Roberts' Rules of Order shall be the governing parliamentary law of the Association in all cases not definitely provided for by its Constitution or its own rules.

ARTICLE XI—VOTING AND PROXIES

SECTION 1 A roll call shall be ordered on the demand of ten (10) Class A members on any question before the Association. Where it is not otherwise specified in this Constitution the authorized delegates shall cast their votes by rising.

SECTION 2 Voting by proxy shall not be allowed at any meeting of the Association, or of any of its committees.

ARTICLE XII—COMMITTEES

SECTION 1 The President shall name such Committees as may seem to him desirable, subject to the approval of the Executive Committee, and he shall appoint the members thereof.

SECTION 2 Unless otherwise provided, the terms of Members of Committees shall expire with the end of the month of June next following their appointment, unless sooner terminated by the Executive Committee.

ARTICLE XIII—GEOGRAPHIC SECTION

SECTION 1 Upon application of five (5) Class A members or two-thirds of all the Class A members, if less than eight (8) in any state, territory or dependency of the United States, Dominion of Canada or any other country in North America, the Executive Committee shall authorize the applicants to organize a Geographic Section of the National Electric Light Association, to which all members of the National Electric Light Association in such Geographic Section shall be eligible for membership. Geographic Sections other than those herein stated may be formed subject to the approval of the Executive Committee.

SECTION 2 Except as herein provided no companies, associations, firms or individuals not members of the National Electric Light Association shall be eligible to any form of membership in any Geographic Section of the National Electric Light Association, but nothing herein contained shall serve to prevent any Geographic Section from holding joint conventions with similar organizations of other public utilities, provided the expenses of such joint conventions are equitably shared by the different groups of utilities participating.

SECTION 3 State and other Associations having both electric company and gas company members—the electric companies which are members of the National Electric Light Association being in the majority—shall be admitted as Geographic Sections.

SECTION 4 When the president of a Geographic Section having members other than central station electric companies and their employees, is not a member of the Association, the said Section shall elect from its electric central station members who are National Electric Light Association members a National Executive Committee Representative to represent the said Section at the National Executive Committee meetings, as provided in Article IV, Section 3.

ARTICLE XIV—COMPANY SECTIONS

SECTION 1 Upon the application to it by any Class A member, having in its employ not less than ten (10) Class B members, the Executive Committee shall authorize the organization of any or all of the officers and employees of said Class A member into a Company Section of the National Electric Light Association, the Officers, Executive Committee and Committee Chairmen of which shall be elected from the Class B membership.

SECTION 2 A Company Section may include as Limited Members those employees of Class A members who desire to participate in the local Section's activities, but who are not yet qualified for Class B membership. The dues from such Limited Members shall go into the local Section treasury.

ARTICLE XV—MANUFACTURERS' SECTION

SECTION 1 Upon application to it of at least ten (10) Class D members, the Executive Committee shall authorize the formation of a Manufacturers' Section of the National Electric Light Association, to which all Class D and Class E members of the National Electric Light Association shall be eligible to membership.

SECTION 2 The form of organization of the Manufacturers' Section shall be subject to ratification by the Executive Committee.

ARTICLE XVI—NATIONAL SPECIAL SECTIONS

SECTION 1 Upon the application to it of not less than ten (10) Class A members, the Executive Committee shall authorize the organization of a National Special Section of lawyers, accountants, engineers, purchasing agents, commercial men, or of any other class of persons connected with the conduct of central stations.

SECTION 2 No person not a member of the National Electric Light Association shall be eligible to membership in any National Special Section of the National Electric Light Association.

SECTION 3 The form of organization of each National Special Section shall be subject to ratification by the Executive Committee, and subject to amendment by Class A member vote at any annual meeting in the same manner as provided for in this Constitution in Article XX.

SECTION 4 National Special Section annual meetings and conventions shall be held only in such places and on such dates as the Executive Committee may determine.

ARTICLE XVII—REFUNDS TO SECTIONS

SECTION 1 Upon certification to the Treasurer of the National Electric Light Association by the executive officers of any Geographic Section stating the membership of such Section who have paid dues for the full calendar year, and upon approval of the Executive Committee, the Treasurer of the National Electric Light Association shall pay over to the proper officers of the said Section an amount not to exceed fifty (50) per cent of the yearly dues received from all the Class A and Class D members of the Section and an amount not to exceed fifty (50) per cent of the yearly dues received from the Class B and Class E members of the Section. The Executive Committee, however, shall limit these appropriations to any amount that it may deem advisable. The Section officers shall file a budget during January of the estimated expenses for the ensuing year for the approval of the Executive Committee and shall also file a detailed statement of the actual expenses at the close of each year.

SECTION 2 Upon certification to the Treasurer of the National Electric Light Association by the executive officers of any National Special Section stating the paid-up membership of said Section, and upon approval of the Executive Committee, the Treasurer of the National Electric Light Association shall pay over to the proper officers of said Section an amount not to exceed $2.50 per year per member of said Section. The Executive Committee, however, shall limit these appropriations to the necessary and reasonable expenses of the Section. The Section officers shall file a budget during January of the estimated expenses for the ensuing year for the approval of the Executive Committee, shall file a detailed statement of the actual expenses at the close of each year, and shall report in writing at least every sixty (60) days stating the work being carried on by the Section.

ARTICLE XVIII—NATIONAL CONFERENCES

SECTION 1 Upon application to it of at least fifteen (15) Class A members the Executive Committee shall call a National conference upon any designated subject or subjects affecting the central stations, due notice of which conference shall be sent to each member of the Association.

SECTION 2 The expenses of National conferences may be met by appropriations by the Executive Committee from the general funds of the Association and by special contributions, which latter shall be governed as prescribed in Article V, Section 2, for the special annual convention funds.

ARTICLE XIX—BULLETIN

The Association shall publish a monthly magazine, to be called "National Electric Light Association Bulletin," which shall be under the direction of the Secretary, subject to the approval of the Executive Committee as to the policy and scope thereof and the expenditures therefor. The annual subscription price of the National Electric Light Association Bulletin shall be $3, and is included in the annual dues of the members.

ARTICLE XX—AMENDMENTS

Amendments to this Constitution shall be offered in writing, and shall be referred, before being acted upon, to a Committee to be elected by the Association. A two-thirds vote of all Class A members present shall be necessary for their adoption.

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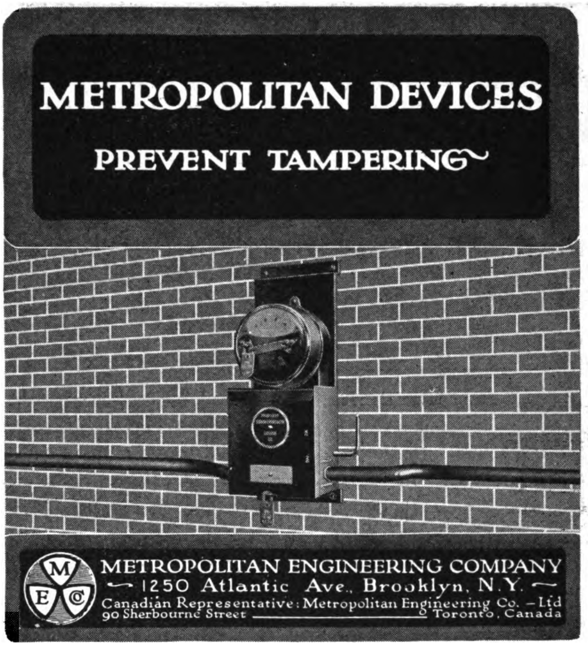
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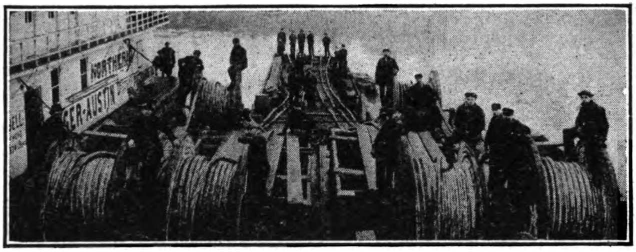

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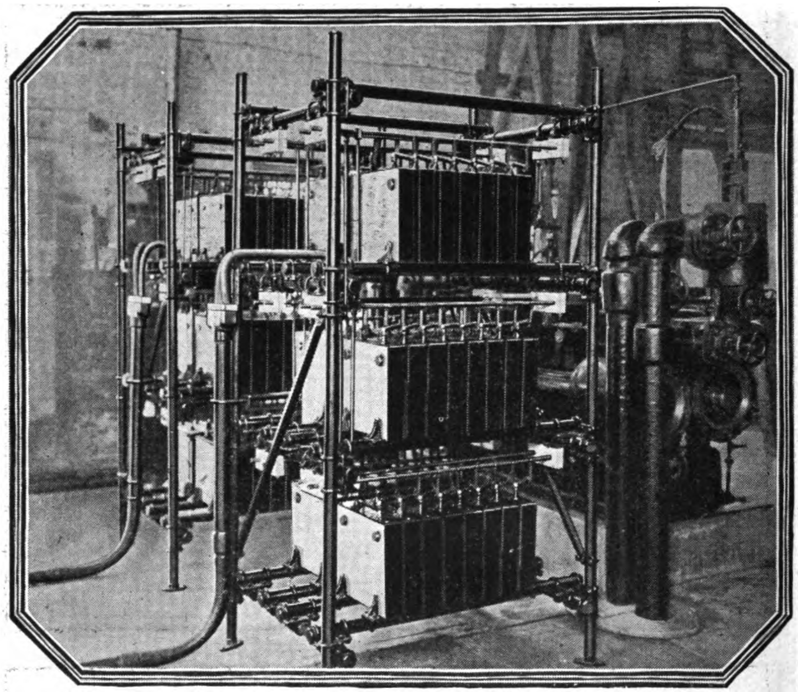

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As a result of the improvement in power factor, the generator excitation requirements were reduced and the voltage regulation improved.

The condenser installation produced these results quicker and cost less than additional generating equipment.

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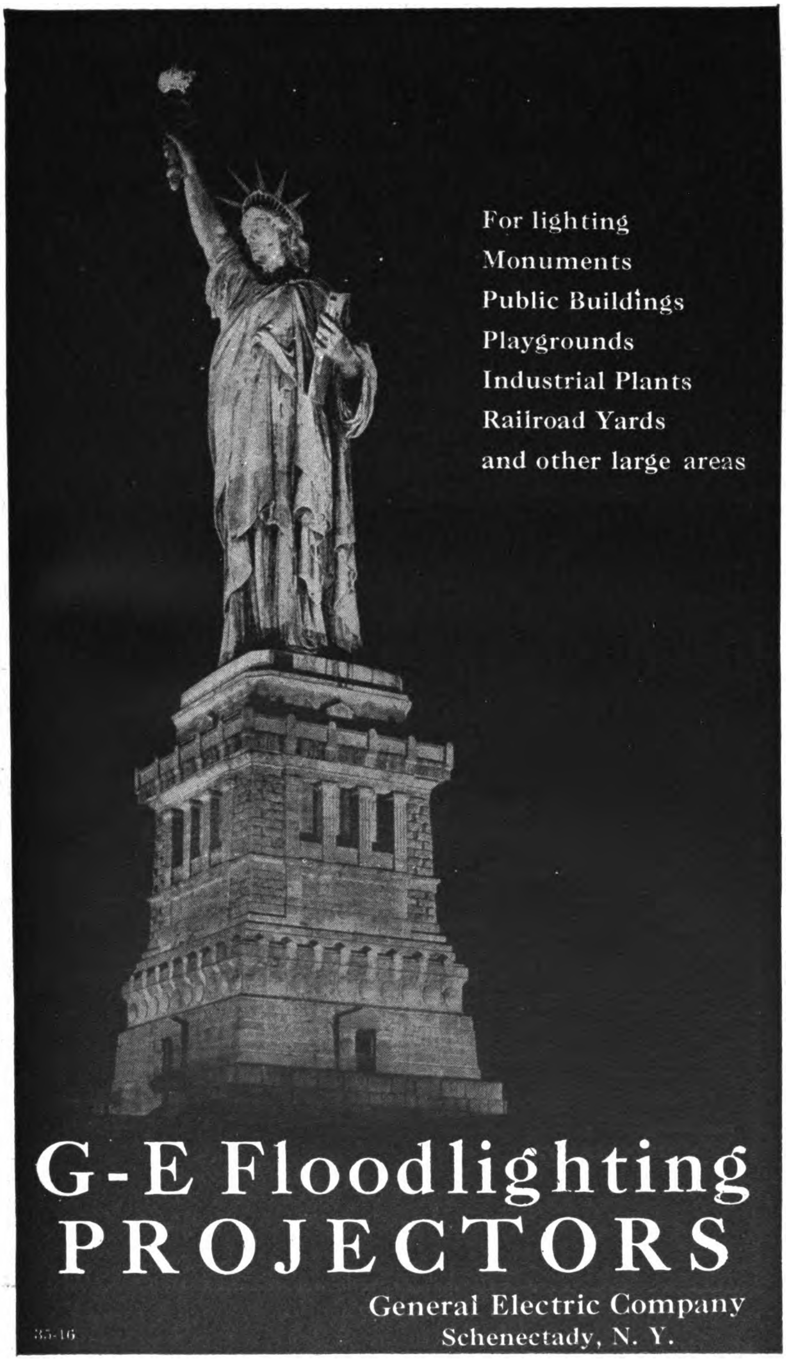
General Office Schenectady, N.Y.



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MAZDA

The spirit of progress in the electrical industry has made possible the development of the *white* National MAZDA lamp—a new guide post on *the way to better light.*

NATIONAL LAMP WORKS
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Each of the labels below represents a Division of the National Lamp Works equipped to give a complete lighting service.

The Westinghouse Electric & Manufacturing Company announces the

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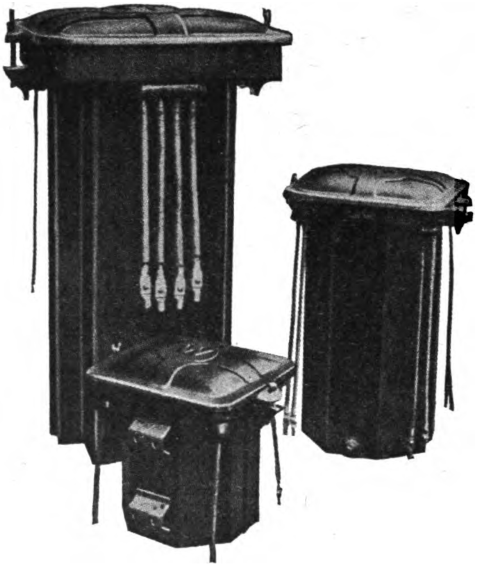

WESTINGHOUSE ELECTRIC

The New Type S Transformer

is one-third lighter than the old type. It minimizes pole strain; it is easier to handle, and saves transportation expense. Most important of all, it includes all the safe guards against failure that the best engineering talent can devise, and has a well balanced electrical performance.

In its color, a radical step forward has been taken by doffing the somber black finish for a smooth, battleship gray. The elements of ruggedness and durability are thus combined, in the Steel-Clad Type S Transformer, with a most pleasing appearance.

Light—Rugged—Durable—Efficient

Circular 1607 Tells the Story; Send for a Copy

Westinghouse Electric & Mfg. Co.
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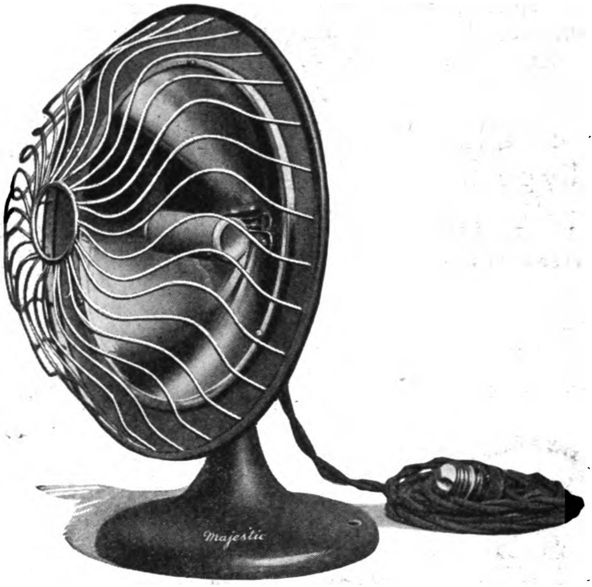
Westinghouse



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Some of the Majestic Heater's exclusive features are Double shell construction with **solid copper reflector;** scientific and practical heating element: safety guards improved in design and mechanical construction, and which can be easily and quickly removed.

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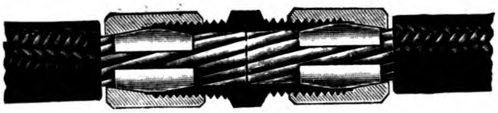

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To help the country to Dossert service we waived our patent rights for a specified war period, now expired. Other manufacturers were thereby enabled to produce for the government solderless connectors embodying the Dossert Tapered Sleeve.

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Total Population Served - Over 2,500,000

Oil and Refineries

Barrels of Oil Produced	17,032,693
Number of Oil Wells Owned	3,137
Daily Refining Capacity (Barrels of Crude Oil)	33,585
Oil Storage Capacity in Barrels	6,447,541
Number of Tank Cars Owned and Leased	2,323
Number of Distributing Stations (Excluding Foreign Countries)	165

Electric Light and Power

Kilowatt-hours Sold	513,714,799
Kilowatts Installed Capacity	268,363
Kilowatts Connected Load	442,333
Number of Customers	169,618
Population Served	1,286,000

Natural Gas

Gas Sold in Cubic Feet	46,814,889,000
Number of Gas Wells Owned	2,181
Miles of Gas Mains Owned	4,529
Population Served	976,985

Artificial Gas

Sales in Cubic Feet	6,112,357,000
Twenty-four-hour Capacity in Cubic Feet	18,523,000
Number of Customers	103,041
Miles of Mains on 3-Inch Basis	1,748
Population Served	1,031,000

Electric Railways

Number of Passengers Carried	109,174,092
Miles of Track	407
Number of Cars Owned	908
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The two together make correct industrial lighting possible

Elliptical Angle Reflector

However,

If co-operation within the industry, between all its elements, the lamp company, Central Station, and the manufacturers had not existed, it is possible to predict that electric lighting would not be as far advanced as it is today.

Industrial Lighting is having its inning. Rightly handled, correct lighting will exercise a powerful influence upon lighting companies; in fact, upon the future of all the members of the National Electric Light Association.

If any of you would like to know what the Benjamin Company is doing along this line, address our Illuminating Engineering Department, 806 West Washington Boulevard, Chicago.

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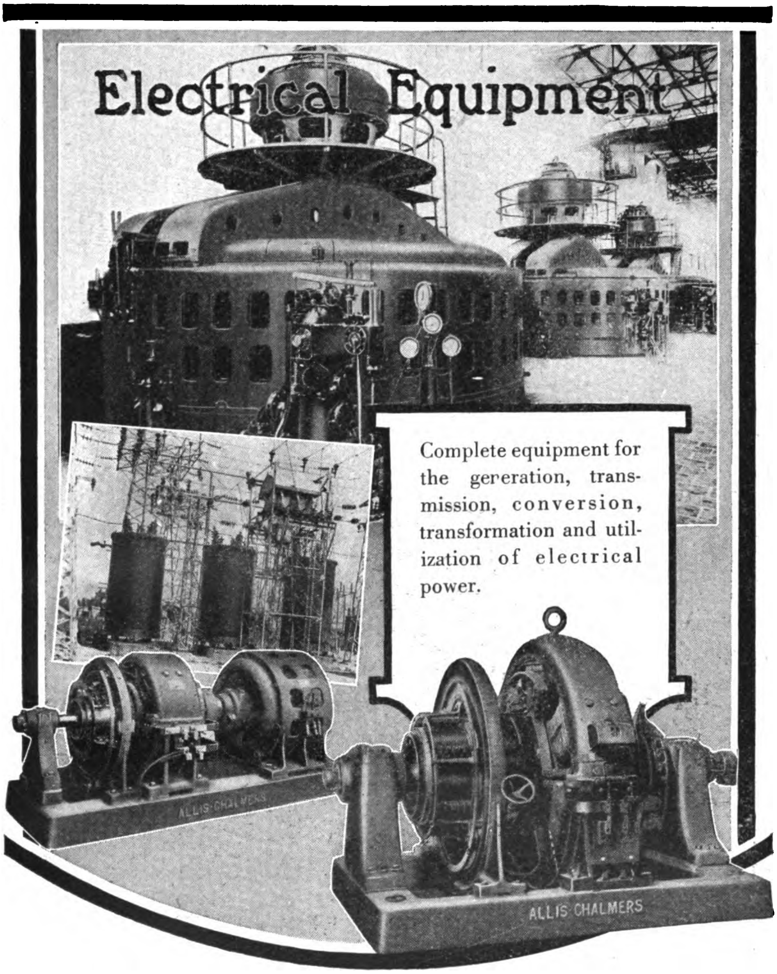

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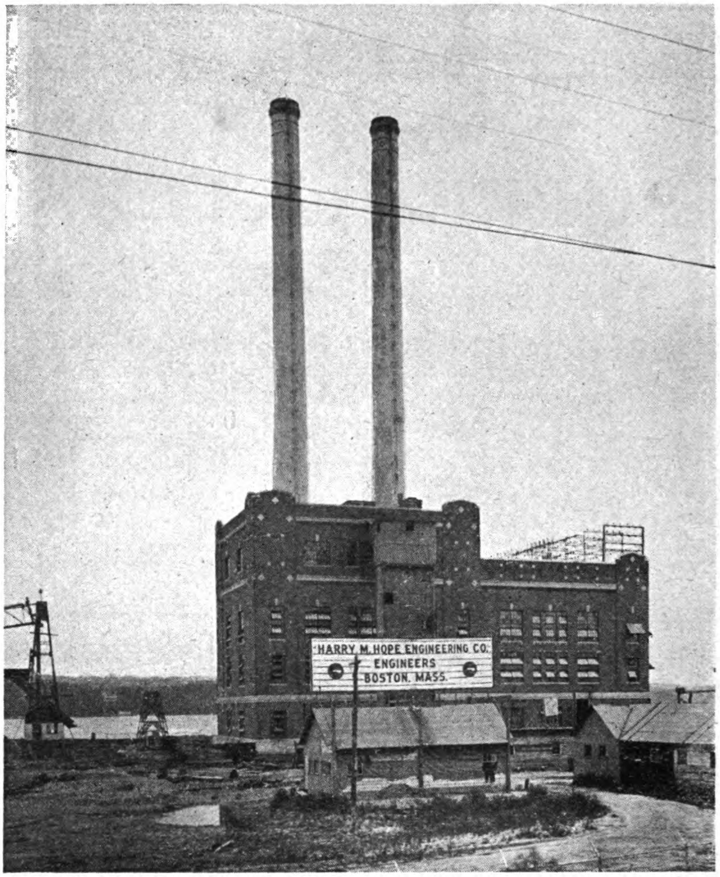

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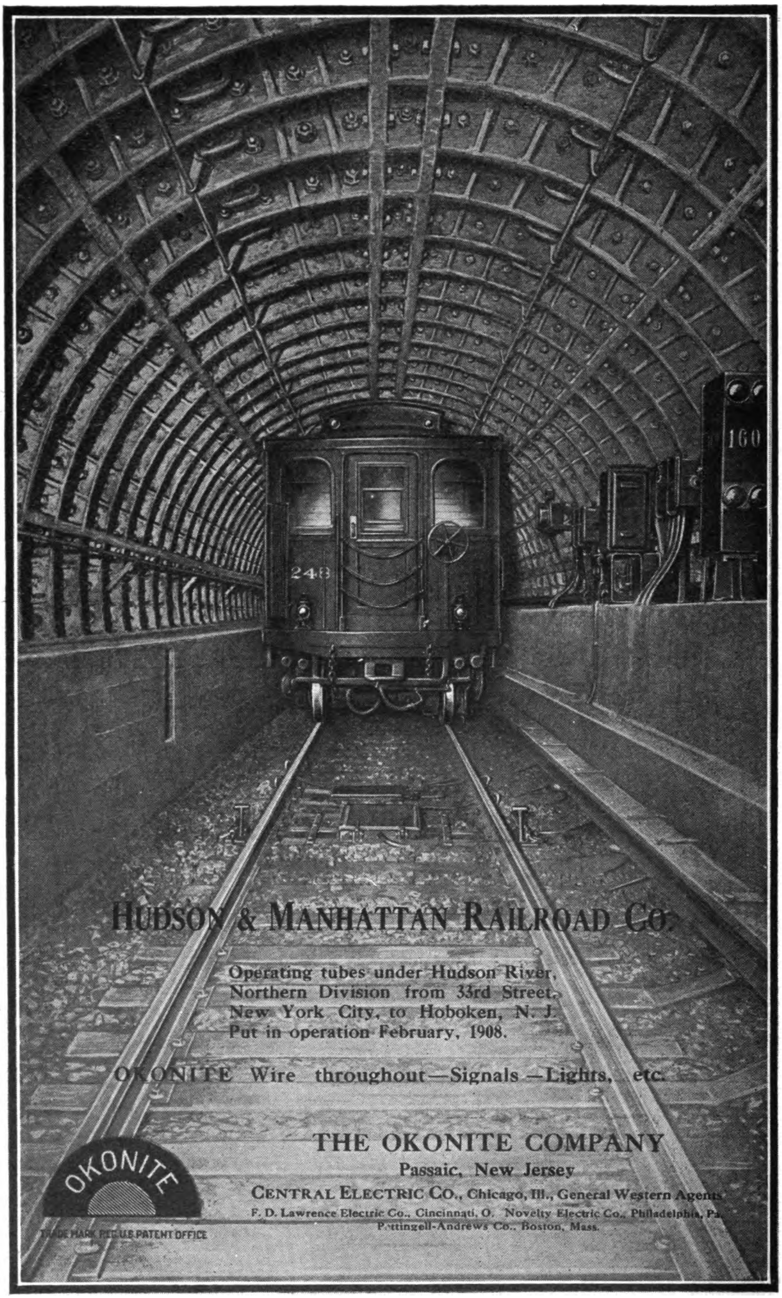

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